

· BOBBS MERRILL GEOGRAPHIC READERS ·

ACROSS SEVEN SEAS TO SEVEN CONTINENTS



AITCHISON AND UTTLEY

FROM COUNTY LEFT OF SCHOOLS
BOULDER, COLORADO

Are you wondering what the title of this book means? Before you finish reading it, you will have crossed the seven seas so many times they will be old friends. You will have discovered for yourself every one of the seven continents. You will meet many strange peoples, but they will think you are just as odd as you think they are. You will find some people feasting

on , while others dine on



Some people
look like this,



while others
look like

this . Some of the houses
are like this

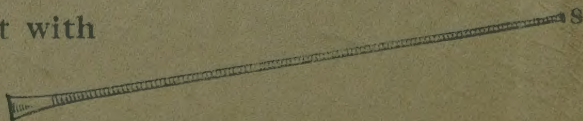


others are like this

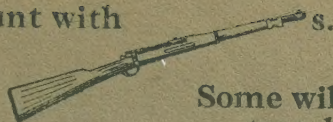


Some men hunt with

through which they blow ———s,



while others hunt with



Some will
travel on a

while others go by



Some make

their living herding



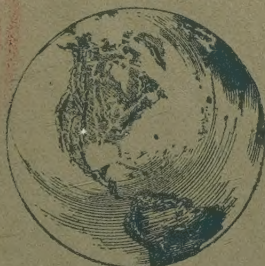
s, while

others



Many of the peoples of this

big wide wonderful



seem strange

to us. Why? Just because their ways are different from our ways. We can not understand people until we know about the lands in which they live. Then we shall see that Nature has provided in the great out-of-doors the things which man uses in securing his food, clothing, shelter. We shall find, also, that he must fit his house, his clothes, his food, his work, to the seasons of the land in which he lives. As you read of these distant lands think what changes you would have to make in your own way of living if you went to visit any one of them.

Margaret Brewster
from
Mr. Zingg

ACROSS SEVEN SEAS TO SEVEN CONTINENTS

BOBBS-MERRILL GEOGRAPHIC READERS

ACROSS SEVEN SEAS TO SEVEN CONTINENTS

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ILLUSTRATED



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THE PURPOSE OF THIS READER

In planning and writing this book the authors have set for themselves these objectives:

(1) *To introduce to the children the concept of the relation between man and the surroundings with which nature has supplied him.* Used as a supplement to the geography text, the book furnishes a detailed study of isolated peoples whose dependence upon their local natural resources for the necessities of life shows clearly the relation of man to his natural environment.

(2) *To lead the child to the purposeful use of globe and map, and with their help to begin to generalize and apply to other regions geographic truths discovered for one typical area.* To increase its usefulness as a basal text in the last half of the third grade or the first half of the fourth grade, each study is followed by a search for other regions with an environment similar to the one studied in detail. This is so arranged as to lead the child to read distance, direction, and symbols from globe and maps.

(3) *To lead the child to begin building up a world framework into which he will fit all his later geographic studies.* Through the detailed study of type environments and through the investigation of other similar regions, it is hoped that the pupil will arrive at an appreciation of certain broad truths such as these: near the equator there is no winter; close to the poles there is no summer; half-way between the poles there are four seasons.

(4) *To cultivate the child's interest in the reading of geographic material.* The matter of this text does not con-

THE PURPOSE OF THIS READER

sist of fictional stories, but of descriptions of actual people. It is written from data secured from source materials, such as correspondence with explorers, accounts written by explorers, climatic records, ethnological reports, botanical surveys and the like.

To aid in the use of the book as an informational reader, a set of "checks" has been provided at the close of each chapter to test: *first*, whether the pupil has gained the information presented; and *second*, whether he can use this information intelligently.

We wish particularly to thank for his assistance, Honorable R. M. Anderson, of the Canadian Geological Survey. Doctor Anderson's many months' stay in a Copper Eskimo village made very valuable to us his review of the section dealing with those people. We are indebted to Mr. T. H. Kearney, of the United States Department of Agriculture, for facts which he gained from his experiences in Jerid and for the use of his pictures on Jerid; also to Colonel Hiram Bingham for the use of pictures which he took in Peru.

We hope that one outcome of the study of this book will be an understanding of, and a sympathy for, peoples who are out of contact with the rest of the world or whose environments are not so rich as those in the greater part of our own country. If this hope is realized the children will have taken a forward step in their preparation for true world citizenship.

ALISON E. AITCHISON.
MARGUERITE UTTLEY.

Cedar Falls, Iowa.
February 26, 1925.

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ACROSS SEVEN SEAS TO SEVEN CONTINENTS



© Ewing Galloway, N. Y.

An Amazon Indian coming through the forest.

ACROSS SEVEN SEAS

TO

SEVEN CONTINENTS

I

INDIANS OF THE UPPER AMAZON FOREST

FAR away, along the Amazon River, live a people who have never seen snow. They have never had their fingers nipped by frost. They do not know what winter means for there the air is always warm. For them Christmas Day is as hot as our Fourth of July.

From their front door they see monkeys scampering from tree to tree and hear them chattering as they swing by their tails from the branches. When the boys and girls want bananas, they go to the trees and gather them. If they need a new bamboo fishing pole, they go a short distance from their home and cut one. There are so many par-

rots in the trees, that they would not think of penning one up in a cage. They are more likely to catch one and cook it for food as we do chickens.

These people are Indians, but they are not like the Indians of the United States. Their land is so different from ours that they do not live as the Indians in our country do. Far from the mouth of the Amazon River and up one of its branches, the Ica River, live tribes who have had little to do with white men. Their land is hard to reach and not easy for white men to live in. Because they are far up the Amazon we call them Upper Amazon Indians.

Only a few explorers have reached this far-off place. An Englishman, named Thomas Whiffen, who was with one of the tribes on the Ica River for nine months, has told much about how the Amazon Indians live.

BREAKFAST IN A FOREST HOME

Let us imagine that we are visiting these Indians for a day. Through the dense forest we see them march in single file. They have just had their morning bath in the Ica River. Each morning during the whole year this is the first thing they do. Now they are on their way to breakfast.

As they walk along the narrow path, they brush against ferns and bushes which grow close to the edge. A second bath of shining water-drops is shaken down upon the Indians, for the leaves are dripping with heavy dew. Always they get this shower bath when they travel through the forest in the early morning. But they do not mind for they wear such a few clothes that nothing will be spoiled.

The Indians have no shoes, stockings, coats, or hats. One short, loose garment is the most they ever wear. It is so warm all the year that clothing such as ours would be uncomfortable. Even in December they do not need to protect themselves against the cold.

Soon our file of Indians, fresh from their outdoor bath, reach their home. The house looks something like a giant haystack, for the roof is thatched with palm leaves. The walls are only a few feet high and the roof slopes nearly to the ground.

Let us go with the Indians into their house. It has but one large room, and it is very dark for there are no windows. The ceiling is blackened with the soot from five or six fires which are kept burning day and night. Several families live in one house,



Courtesy, Field Museum of Natural History

Houses like this are built in hot wet lands.

and each family gathers around its own fire for the meals.

Breakfast is soon ready,—a cup of tea and a piece of cold bread. The tea is not the tea which we know. The cup is nothing like those from which we drink. And the bread—we would hardly know it was bread. Their tea is made from grass and seeds, and it tastes like peppermint. The cup is a half gourd. The bread is made from manioc, a plant which does not grow in our country. Manioc will grow only in a land where there is never any

frost. The Indians have no wheat, so they can not make bread like ours.

A HUNTING TRIP IN THE GREAT FOREST

The Indians have not had any meat to eat for several days, so this morning they decide to go hunting. We shall go with them. The weapons for the hunt are soon collected. Two of the Indians take light spears. Four get their blow-pipes. These are used instead of bows and arrows, such as North American Indians once used.

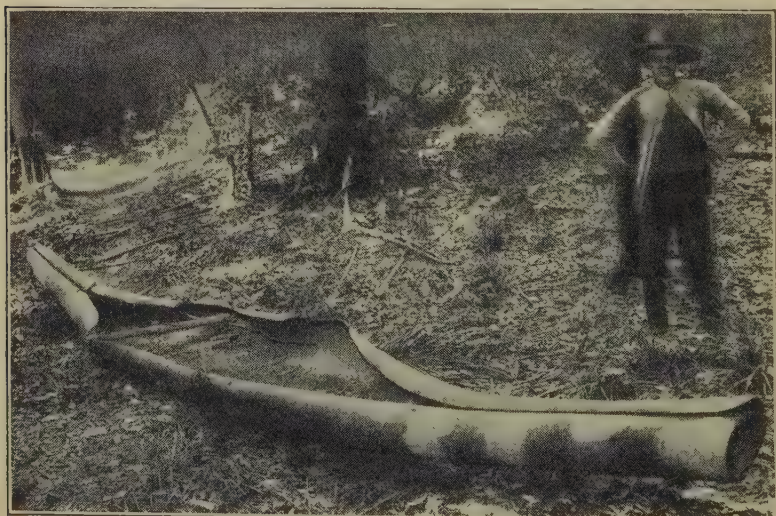
The blow-pipe is a light, hollow tube, longer than a man is tall. Through this pipe, light darts are blown with a sound like the noise of a boy's pop-gun. The dart, or arrow, is about nine inches long and no thicker than a match. One end is sharpened and dipped in poison. A bit of cotton is attached to the other end to make the dart fly straight through the air. With his blow-pipe, a skilful hunter can shoot a small bird sixty feet away.

Darts for the blow-pipe are carried in a bamboo case. The hunter slings this holder filled with darts over his shoulder. Fastened to the holder is a gourd full of the cotton-like stuff which they

fasten to their darts. This is gathered from trees in the forest. It looks like the fluff which grows on the seed of the milkweed.

No paths are found in the dense forest where the Indians go to hunt. The easiest way to travel any distance is by canoe on the river. Several boys, who are old enough, are allowed to go with the hunters. They run into the house and take down the paddles, which are stored on the rafters overhead.

When they reach the Ica River the men lay down their weapons and go back into the bushes where



A partly made canoe.

their canoes are hidden. These are made from the bark of palm trees and are very light. The hunters quickly carry their boats to the shore and place them in the water. Picking up their weapons, they step lightly into the canoes and push off.

The canoes glide down stream between the green forest walls. Smoothly and easily they move through the water. So dense is the forest that the hunters can not see far into it as they paddle along. Beautiful blue butterflies and green and yellow humming birds flit across the stream in front of them.



© Brown Bros.

Amazon Indians starting on a hunting trip.

After half an hour's work in the hot sun, the paddlers are wet with perspiration. Soon they come to a place where a tree has fallen across the stream. Over this the canoes must be hauled.

As they pull, one of the Indians slips on the log and splashes into the water. He does not mind this dip in the least. He likes four or five baths a day, for this is the only way he can cool off. When the others spy him in the water, they shove the bows of the canoes into the bank to hold them fast and join the swimmer. The few clothes they wear do not matter, for they soon dry in the hot sun.

As they climb back into their canoes the hunters discover on the sand the tracks of a young tapir. Two men get out of one of the canoes to follow these tracks, while the others paddle slowly down stream. The Indians on the shore walk rapidly along until they come to the place where the tapir has turned into the forest. There they signal to the boatmen to pull the canoes up on shore and follow them as they strike out on the trail of the beast. Every man must watch closely, for the forest is dark and the tracks hard to see.

The young tapir they are following is about the



Courtesy, New York Zoological Society

These tapirs were brought from the Amazon to the zoo in New York City. The baby tapir is like the one the Indians hunted.

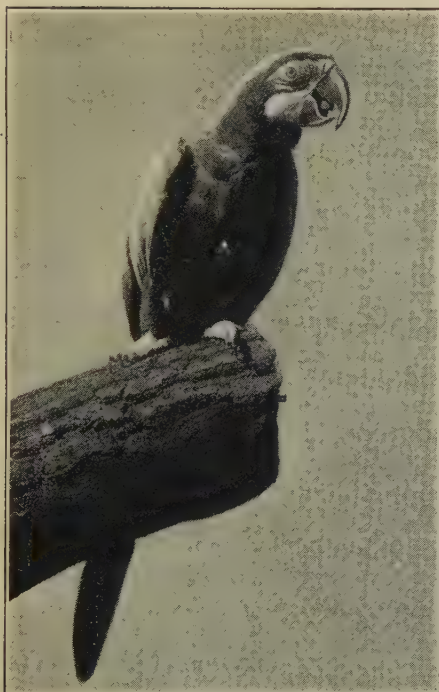
size of a hog. Yellow spots on his coat make him look like the ground where little flecks of sunlight break through the leaves. It is therefore hard to see him among the ferns and the bushes.

When the hunters have gone some distance, one of them spies the tapir. At a signal all stand stock still until he hurls his spear. But the tapir catches sight of the hunter in time to save himself and away he crashes into the bushes.

Having lost the tapir, the Indians go on into the forest searching for more game. There are no roads to follow, not even a trace of a path. The trees are so close together that their branches meet overhead. Their broad leaves form so dense a cover that only here and there does a little sunlight break through. Great vines climb and twine around the tree trunks, and hang in loops from branch to branch. Some of the loops swing almost to the ground. Around each large tree great roots spread out. Ferns, creepers, and moss form a green carpet in many places.

It is impossible to go straight ahead through such a tangle. The men turn and twist about, trying to get through first one way and then another. In some places a fallen tree blocks their way. Sometimes they have to go around a net-work of vines. Making way through such a forest is slow work.

The hunters travel along in single file for several hours, making no unnecessary sound. On every side are great masses of green. No matter what month of the year they go on a hunt, the forest is always green. The trees do not shed their leaves all at once, as some of ours do. There is never any



Courtesy, National Zoological Park

A blue and yellow macaw.

frost nor any dry season to make a tree drop its leaves. Very few colored flowers brighten the way. The forest is very dark and gloomy on all sides. Now and then, the silence is broken by the calls of parrots and macaws.

Often the hunters must cross low swampy places. Sometimes they sink down to their knees as they flounder through the mud. In other places

they have to walk around ant hills, some of which are ten feet across and as high as the heads of the hunters.

Suddenly, off in the distance the hunters hear the chatter of monkeys. Quickly they move in the direction from which the sound comes. The chatter grows louder and louder. Soon they come to a



Courtesy, Field Museum of Natural History

The hunter aiming his blow-pipe.

tree laden with fruits, both ripe and green, and bearing bright colored blossoms. Up among the branches half-a-dozen monkeys are enjoying themselves. So busy are they feasting on the fruits high up in the tree top, that they do not see their enemies coming.

The Indians creep up under the tree, and three of them, taking their blow-pipes, blow their arrows. Two

hit their marks. The other monkeys race away from branch to branch and swing by their tails across to the next tree. One monkey that is hit by the arrow drops to the ground immediately. The second hangs

by its tail to a branch, although the arrow has killed it. The hunters know what to do; they only need to sit down and wait until it falls.

Once before when they were waiting for a monkey to fall, an eagle swooped down and snatched it from the branch. Now one Indian stands with his blow-pipe loaded and aimed, but no eagle comes this time. Soon the monkey falls and they are ready to move on with their game.

Through an open place in the leafy crown of the forest they see the sun almost over their heads. They are hungry, but they have brought no lunch. One of them climbs a tree and throws down red, cherry-like fruit. This serves as their noonday meal.

Their lunch over, the hunters start back through the forest. Keeping careful watch for twigs they had broken to mark the way as they came in, they travel slowly toward the river. We would get lost in a forest like this, but the Indians have trained themselves to follow small signs which we would never see—a broken twig, an overturned log, or a queer-shaped clump of moss on a tree.

Before they reach their boats a sudden shower comes up. Thunder roars and lightning flashes. A

heavy downpour of rain sets in and lasts for half an hour. The large drops pounding on the broad leaves sound almost as a hailstorm would to us. The Indians are not in the least surprised, for the days when it does not rain are few. Such a rain comes every afternoon regularly. There are perhaps only four or five days in the whole year without a shower. Sometimes the rain lasts but a half-hour, at other times it may continue far into the night.

Just as suddenly as the storm came up, it is over. The hunters really enjoy the rain because it cools the air somewhat. They have been tramping in the burning heat all the morning, so even a slight cooling off is a relief. As they go on after the rain, water drips from every leaf and they are treated to another shower bath. Soon the sun is shining as fiercely as ever, and the air is hot and steamy.

The Indians do not stop for more hunting but hurry along as fast as they can to get home before dark. Their days are never long like our summer days, and it will be dark shortly after six o'clock. Finally they reach their canoes and shove them down into the water. One monkey is put into each canoe. The paddling is much harder work now than it was in the morning for they are going

up stream. Just as the sun is dropping below the western horizon they reach home, hungry for a feast.

THE MONKEY FEAST

Meanwhile in the great house the women have been preparing the manioc bread for supper. It is baking on earthenware plates over the fires. As the men come in with their game, there is great rejoicing. The women soon skin the monkeys and divide the meat among the different families. Each cook takes her share to the fire, where she places it on a stick and holds it close to the hot coals. There is no table to set, nor any dishes to bother with. The girls spread several broad leaves on the floor. On these they set manioc bread, bananas, and ripe pineapples. Supper is ready.

The family sit near the fire on the floor. As the monkey meat is passed around, each tears off a piece with his fingers. The meat is rather tough, but all enjoy it. This is the first monkey meat they have had for several weeks.

When the meal is finished, there are a few scraps of meat left over. These are not wasted, for it is uncertain when the Indians will get any more. The

scraps are thrown into the pepper-pot. This is an earthenware kettle which is kept simmering on the fire all the time. Into the pot go all the left-overs. Fresh meat, too, is sometimes cooked in it, for this method is easier than roasting it on a stick.

All sorts of foods go into the pepper-pot—fish, frogs, parrot meat, turtle, bananas, manioc root, leaves, and peppers in plenty to flavor the stew. The peppers give the kettle its name. A single large leaf serves as a cover for the kettle. The mixture is stirred with a stick and is ready at any time of the day when one is hungry.

In this hot moist land with no ice and no cool cellars, meat and vegetables must be cooked at once to keep them from spoiling. Even after they are cooked they can not be set aside and cooled for the next meal. Food spoils in a few hours. In order to have food fit to eat, it is kept in the pepper-pot on the fire all the time. If the Indians can not keep their food fresh by keeping it cool they keep it fresh by keeping it hot.

After supper is over, no one ventures out-of-doors. Many wild animals roam about in the darkness and often come near the house. The families sit around the fires and tell stories. The low flicker



Courtesy, National Zoological Park

A jaguar brought to the zoo in Washington, D. C., from the Amazon.

of the fire is their only light. Here is one of the stories which the children ask for again and again.

STORY OF THE TURTLE AND THE DEER

A jaguar once saw a turtle and tried to catch him. As the turtle ran into a hole among some roots the jaguar caught him by the hind leg.

The turtle laughed and said, "You have caught a root of the tree." The jaguar then let go of the turtle and caught a root. The turtle quickly pulled

his leg into the hole. The jaguar waited but the turtle would not come out.

After a while the jaguar was so weak that he could not go away and finally the turtle came out and found him dead. The turtle made a barbecue and while he was roasting the jaguar a deer came along and asked the turtle how he caught the jaguar. He said, "By running after him."

The deer did not believe it and said, "Can you catch me?" "Yes," said the turtle, and started for him.

For a long time the deer kept on running, thinking the turtle was after him. When he was nearly exhausted he called, "Turtle, are you near?"

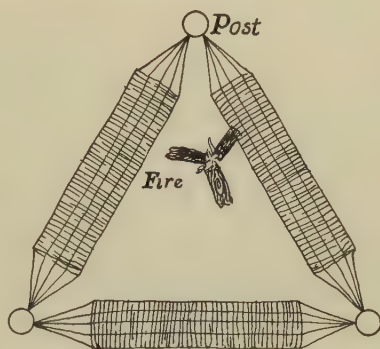
Another turtle who happened to be there said, "Yes, I am." Whereupon the deer fell down dead near the turtle. Then there was another barbecue.*

SLEEPING IN HAMMOCKS

After an hour or two of story telling, every one in the Indian house is ready to go to sleep. Their beds are hammocks, which hang close around the fire. Nearest to the fire hangs the father's hammock. The mother and children have the others.

* Collected by Dr. Wm. C. Farabee and printed by permission of the University Museum, Philadelphia.

In order to keep warm, they must sleep close to the fire. For in this land where it is so very hot in the daytime the nights are cool, and the Indians have no bed covering.



Wall of House

The way the hammocks are hung by the fire.

The reason that the nights are so much cooler than the days is because the nights there are as long as the days. Each is about twelve hours. This gives as much time for the land to cool off as for the sun to heat it in the daytime.

Along toward morning it becomes so cool that some member of the family gets out of bed to see to the fire. He pushes the logs closer together and blows on the embers to start a blaze. Though the nights are seldom cooler than 70 degrees, even that feels cold to one who is used to 90 degrees during the day. So the Amazon Indians shiver in a temperature which we would think comfortable.

Not only does the night fire keep the sleepers

warm, but the smoke helps protect them from insects. Mosquitoes and other biting and stinging insects fly by the thousands. They are bad enough in the daytime, but they are much worse at night.

Many creeping and crawling things are not kept away by the smoke. If the Indians slept in beds, the bedposts would furnish runways for the crawlers and creepers. In order to protect themselves against these pests at night, they sleep in hammocks.

KEEPING THE FAMILY FIRE

It seems strange that in such a hot land the family fire should be kept burning all the time. But these Indians have no matches, and where there are no matches and little dry wood it is easier to keep a fire burning than to light a fresh one.

Suppose their fires go out, what can they do? There are no near-by neighbors from whom they can borrow hot coals. They must hunt for dry wood, which is not easy to find in this land where rain falls every day and where the air is always damp.

When the dry wood has been found, one piece is rubbed against the other until a spark flies, and a fire is kindled. This is very slow work. No

wonder that every one in the family is willing to help keep the fire burning.

Of course when fuel costs nothing, people do not mind having to burn a great amount. Dense forests surround the Indians' houses on all sides. All they need to do is to go out and carry in the fallen logs or cut down trees for fire wood. Plants grow rapidly in this hot wet land. In a few years after trees are cut, new ones grow in their places.

People living so far from stores are not likely to have stoves, so the Indians build their fire on the clay floor. If they had stone they might build fireplaces, but in the lowlands where they live it is very difficult to find stone.

Three logs are laid on the floor somewhat in the shape of the letter Y. At the point where they meet, the fire is started. These logs will last several days, as the damp wood burns back slowly. Any one who is passing looks to see if the fire is dying down and pushes each log in toward the center.



The Family Fire

BUILDING A NEW HOUSE

One day a dreadful wind storm swooped down on that part of the forest where the great house stood. A corner of the roof was torn off. In poured the rain and the clay floor underneath soon turned to mud. The family that lived in that corner had to crowd over into another part of the house.

When the rain was over, it was found that the house was badly damaged. To build a new house would be better than to repair this one. The owners were not very sorry, because the house was rather old anyway. They had lived in it for nearly two years. Besides this, they had discovered the week before that white ants were eating the corner posts. Several of the supports were badly honeycombed by the ants, and would not much longer hold up the great roof.

White ants are the great torment of people who live in tropical forests. Few wooden things are safe where white ants live. Wooden floors last only a short time. Clay or tile floors are much better. If there is furniture, it must be carefully watched. White ants like to make a meal of a chair or a table. One way to keep furniture safe is to set it

on pieces of tin. When swarms of ants move into the house, the people usually move out for this is easier than to drive the ants away.

The Upper Amazon Indians move very often. They have gardens in little clearings in the forest. In two or three years the soil in one of these gardens wears out. Weeds, vines, and bushes grow so fast that they choke out the crops. It is less work to make a new clearing and start a new garden than to keep up the old one.

The Indians of the damaged house had already picked out a place for a new garden. This was about a mile and a half farther up the Ica River. After the storm they decided to move there at once and build a new house.

Soon after sunrise on moving day, they begin carrying all of their belongings out of the house. Each family takes down its hammocks and ties them into bundles. These they lay on the ground outside and beside them pile the cooking dishes, weapons, and their "dress-up" clothes. Nearly every Indian has a necklace of monkey teeth, bracelets and anklets of rattling seeds, and a headpiece made from bright feathers of parrots and macaws. These clothes are used for special occasions. They do

not make a very heavy load when it comes time to move.

Live coals are carefully placed in deep earthenware jars to be carried to the new home. Surely one of the fires will still be burning when they arrive, and from it each family will light a fire.

The movers carry all their belongings through the forest, across a vine bridge over a small stream, through still more forest to the canoes on the Ica River. The goods are loaded into the canoes, and the men paddle more than a mile up the stream. Finally they reach the place which they had selected for their new garden and the canoes are quickly unpacked.

The new house will not be ready for a week or two, so each family builds a little roof to sleep under. Some protection is necessary from rains and the heavy dew. Building this shelter does not take long, since the materials for it are right at hand.

Before the building of the great house is begun, a space in the forest must be cleared. All the wood and vines cut down are saved for building material. The vines are put to soak in the near-by river so they will bend easily when the builders are ready to use them. The leaves from the felled



Courtesy, Field Museum of Natural History

Bridges like this are sometimes built across small streams in hot wet forests. It is easy to get the vines and to swing the bridge from tree to tree.

palms are piled up by the children. These will be used for thatching the roof.

As soon as the clearing is finished, the building of the house begins. First the side and end posts are set up. Since they have no nails the rafters



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This thatch was built to shelter the Indians from the daily rains, while they were waiting for the new house to be finished. Where did they store the household goods? Why do they have hani-

of the roof are lashed to the posts with the vines which have been soaking in the river.

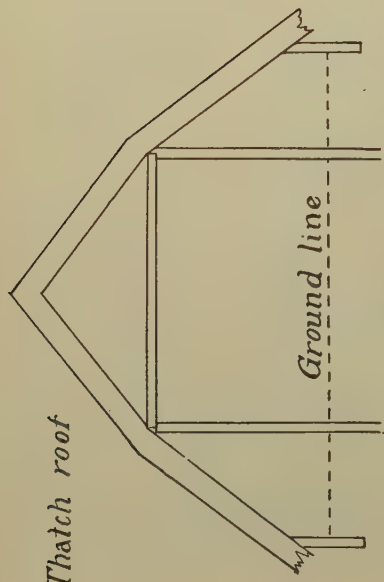
When the framework is up the Indians begin work on the roof. They are very particular about this, for it is the most important part of the house. The chief reason for building a house in the tropical forests is to secure shelter against the heavy downpours of rain. To make the roof thick enough to keep the rain out they tie on layer after layer of palm leaves. The finished roof is at least a foot thick and very sloping. The builders do not wish to be waked up some night by rain dripping on their hammocks.

The walls of the house are made by weaving grass and leaves through the frame-work of saplings. This is quickly done. Holes in the house wall do not matter. They will let out the smoke and let in the air.

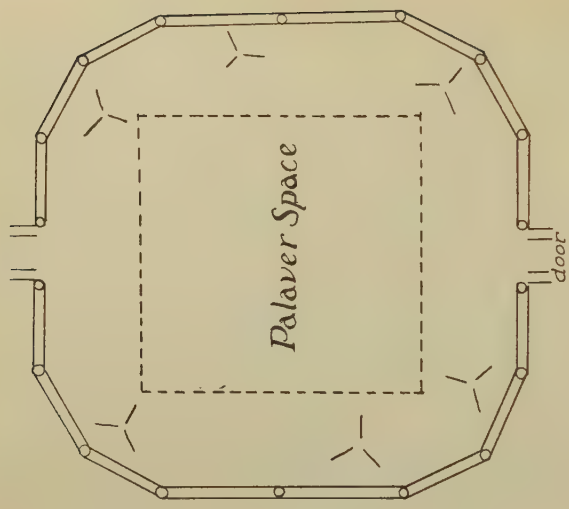
Over the doorway a curtain of palm leaves is hung. No windows are made. If the house is dark certain kinds of insects will not be likely to enter. If the sunlight is kept out, the room will be cooler.

The interior of the house resembles the space inside a big circus tent. The center is left clear. There the children may play or the tribe hold its

Thatch roof



End View



Floor Plan
family fire

The Plan of the Great House

“palaver.” Among Indians of North America this meeting of the tribe would be called a “pow-wow.” Around the sides of this open space are places for each family. Most of the family possessions are stored against the rafters over head. There it is drier and the danger of ants is less than on the floor.

THE PLANTATION

The Indians of the Upper Amazon can not depend upon wild animals and fruits of the forest to furnish them all their food. If they did, they would feast one day and then perhaps starve for three or four days. To make sure that they will always have a food supply, they plant gardens.

So after the Indians are sheltered in the new house they begin work on a new plantation to take the place of the one they have left. They will not be able to get food from this new garden for eight or nine months. They hope that the old one will last that long, though the weeds are growing fast. If they allow the jungle to choke out the manioc and bananas in the old plantation before the new one begins to bear they may have to go hungry.

We would hardly call the work done by these Indians farming. If we were there we would see no plows, no horses, no tractors. We would see no fields of wheat, oats, or white potatoes.

Their fields and gardens look very much the same at one time of the year as they do at another. There is no regular planting time and no regular harvest time. These Indian farmers harvest a little and plant a little at any time of the year they choose. In a country which has rain and warm weather all the time, crops will grow the year around. The Indians do not have to work hard in the summer to grow food for the winter as do most of the farmers in the United States.

The hardest work for the Indians is clearing away the forest from the piece of ground they wish to plant. First they girdle the big trees by stripping off a band of bark all the way around the trunk. This kills the tree because then the water that is in the ground can not rise to supply the leaves with the moisture they need. After a few weeks the leaves drop and the sunlight can find its way into the patch.

In the meantime the men busy themselves a few hours each morning cutting down the saplings,

vines, and bush with their machetes (ma-ché-tes). A machete is a big knife which the Indians get from the trader. It is one of the most precious possessions of the native. He needs it for building a house, cutting firewood, making a clearing, and skinning game.

When all the cutting is done, the Indians bring hot coals from the big house and set fire to the brush and felled trees to get them out of the way. Damp wood does not burn easily. The Indians may have to try several different days before they are successful in starting a fire. Sometimes they even have to wait several weeks before it is dry enough for them to get a good burn. Then the ground is covered with ashes, which make the soil richer. Here and there over the clearing the dead trees stand up like huge posts.

The preparation for the garden has taken the Indians a long time. For it is only in the early morning that the men work. By eleven o'clock the sun has risen so high in the sky, that working out in the open is very trying. No one living as close to the equator as this can do very heavy work with the sun beating down upon him. An hour before noon the men go back to the great house



Courtesy, Field Museum of Natural History

At work in the clearing. The corn is already more than a foot high.

where they sleep in their hammocks until late in the afternoon.

After the clearing is made, the women take charge of the plantation. In the soft rich earth they plant manioc, bananas, sweet potatoes, pumpkins, corn, and pineapples. There is no system or plan to their garden, no rows, no paths. The plants come up quickly because of the heat and moisture, but the weeds are still quicker. With

wedge-shaped sticks for hoes, the women fight the weeds. They are not very successful gardeners, for they work only an hour or two each morning.

Best among the crops is the manioc, whose roots look something like sweet potatoes. At the end of about eight or nine months the roots of the manioc are nearly eight inches long. If they are left in the ground for two years they grow to be more than sixteen inches long. It is from the roots of the manioc plant that the tapioca we use is made. Manioc is sometimes called *cassava*. The Indians use the manioc to make bread.

When the crops are ready for use the women go to the garden and bring back heaping baskets of manioc roots, bananas, pineapple, sweet potatoes or whatever else they need for the day's supply.

MAKING MANIOC BREAD

As the women bring the roots from the garden they stop at the river bank to wash them. Their next work is to peel off the thick bark-like skin. The peeled roots are washed again in the river and carried to the house. There they are placed in bowls of water. After the manioc has softened it is grated

into a large wooden trough. The grater is a block of soft wood with black palm-thorns driven into it.

Manioc contains a poisonous juice which must be pressed out before the plant is good for food. The grated manioc is next placed in a squeezer which looks like a huge stocking about seven feet long. This bag is woven out of the fiber of a palm tree. At each end is a big loop. One loop is tied to a rafter and the other is fastened to a stick. A woman sits on one end of the stick. Her weight stretches out the squeezer and the poisonous juice is pressed from the pulp.

After the juice is squeezed out, the manioc flour is dried over the fire. Drying is a slow process in this moist air. It is indeed hot work to stand beside the fire and stir the pulp several hours until it is dry.

After the manioc flour is dry, it is rubbed fine and sifted. When the flour is prepared it is kneaded with a little water, then put into earthenware pans and baked over the fire into flat cakes. Manioc bread is the most important food of the Amazon Indians.

THE TURTLE HUNT

From January to July the big rivers rise and flood out over their banks. This is the time of the heaviest rains of the whole year. Rain pours for several hours each day. It often continues day and night for a week at a time. By October the rivers have gone down and left great stretches of sand uncovered.

This is the time when turtles come out on the sand banks to lay their eggs. The turtle scrapes out a hole in the sand. In this she lays from twenty to two hundred eggs. Then she pushes the sand back over them and leaves them to hatch in the heat of the sun.

To the Amazon Indians, turtle eggs are a treat. Whole families come to the sand banks and camp there for two weeks or more. They collect eggs and turtles, too. They are as fond of turtle meat as they are of the eggs. When a turtle crawls out on the sand and goes to sleep, the Indians creep up and flip it over on its back. Then the turtle is quite helpless and the Indians can drag it to camp.

The jaguars back in the forest like turtle too.

After dark they come out and have a fine feast. Their ugly coughs and snarls can be heard all along the banks. The Indians are careful not to venture out when the jaguars are around.

GATHERING BRAZIL-NUTS

After the turtle hunt is over, parties of Indians spend day after day in the forest gathering Brazil-nuts. They do not need to climb the tall trees for them, because the ripe nuts drop to the ground. When the nuts are falling it is dangerous to be near the tree, for there they may drop on one's head. The nuts grow in a hard wooden case about the size of a coconut. Inside this case or shell are as many as two dozen nuts, packed close together much as the sections of an orange are.

After the nut cases are gathered the Indians crack them open. The Brazil-nuts are packed in baskets which the women weave out of palm fiber. When enough nuts have been packed to fill several canoes, the men start off down stream to go to the trader who lives on the Amazon.

For many miles they paddle their canoes. As they go down the stream the Ica River becomes wider and wider. After several days they reach



© Brown Bros.

These are Brazil-nuts. Brazil is the country from which we buy them.

a house, which is the home of Indians who gather rubber to be shipped to the United States. The house looks as if it were built on stilts. All the houses on the banks of the river are built on high posts set in the ground. The water is low now and the owners have to climb a ladder to get into the house. But at flood-time, the water is so high that one can step right out of one's canoe into the door of his house.

When the Indians paddling down the stream see a canoe in front of the house they know that some one is at home. The last time they came down



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The home of the rubber gatherer.

the river a white man had come out of this house and stopped them. He had tried to persuade them to come and gather rubber for him. But they had heard that the rubber trader was a stern master, and that he made the Indian gatherers work very hard. They decided that they were better off at home than they would be if they worked for him. So now they paddle on as fast as they can go, until they are safely past the house.

After several days they reach the point where

the Ica River flows into the mighty Amazon River. The Amazon is so wide and deep here that large steamboats ply on it. The Indians dare not venture far from shore into the swift current in their little canoes.

At last the boatmen reach the station of the trader. He looks at their nuts and agrees to buy them after they are washed. The canoe-loads are



Courtesy, Pan American Union

One day the boatmen see these people on the bank. They have evidently been trading with white men. What leads you to think so?

dumped into his rowboats and taken to a quiet place along shore. The Indians souse the woven baskets-full of nuts in the water until they are clean and hand them up to the trader's man.

For the Brazil-nuts the Indians are not paid in money. They receive several new machetes, yards of calico, and some bright-colored glass beads.

While they are at the trader's house a large steamer comes along. It stops to pick up a cargo of nuts. The water is so shallow close to the shore that the big boats can not land. So the trader loads



© Brown Bros.

Washing Brazil-nuts.



© Brown Bros.

An Amazon River steamer taking on Brazil-nuts.

the nuts on a barge and takes them out to the steamer. This steamer will carry the nuts to the mouth of the Amazon where they will be loaded on an ocean freighter for the United States. We buy them in the stores and have them on our tables.

Checks

Now that you have finished reading about people who live in the Upper Amazon Basin, check yourself by trying these exercises:

1. From this list select all the things the Upper Amazon Indians probably have never seen.

Write at the top of a sheet of paper, *Things the Upper Amazon Indians have never seen*. Underneath write all the words you have chosen from the list.

automobiles	fish	wheat bread
bananas	snow	ice
manioc	skates	parrots
a radio set	rubber trees	lightning
fur coats	canoes	frost

2. Copy this sentence and finish it with the correct words.

The Amazon Indians keep a pepper-pot on the fire all the time to keep their food from
freezing.
spoilng.
being stolen.

3. In which of these houses would you be most comfortable if you lived in the Amazon region?

(1) A flat-roofed frame house with storm windows and a furnace.

(2) A steep-roofed stone house with screened windows and screened porches.

(3) A steep-roofed grass hut with no windows and no chimney.

4. Copy the following paragraph and fill in the the blanks with words chosen from the list beside:

The Indians who live on the sand bars banks of the ——— River often see ——— and ——— moving through the ———. They parrots hear ——— chattering and forest ——— calling high up in the monkeys tree tops. Sometimes when the jaguars floods go down the Indians see turtles ——— coming out on the ——— to lay eggs.

5. Copy this sentence and finish it with the correct words.

Indians who live on the river bank build their houses up on posts in order to avoid forest fires.

dry weather.

floods.

6. The Indians use the Amazon River for which of these purposes?

bathing

running flour mills

skating

fishing

canoeing

cutting ice

7. Bananas grow all year round in the Amazon region because
it is dry all year. ·
it is cold for part of the year.
it is wet and hot all year.
man works eight hours every day in the garden.

*Some Third and Fourth Graders Have Found
These Interesting Things To Do*

1. Building grass houses on a sand table.
What materials would you use for the framework? If it is winter time and you can not get grass, what will you use for the roof?
2. Finding out how the Indians gather rubber.
A company which makes rubber tires has a booklet which tells how the trees are tapped and the rubber prepared to be sent to the United States. The name of the booklet is *The Romance of Rubber*. It is sent free to teachers who ask for it. The address is, Educational Department, U. S. Rubber Company, 1790 Broadway, New York City.
3. Finding out how the tapioca we eat is made from manioc.

Write to the Minute Tapioca Company at Orange, Massachusetts, for the Tapioca School Exhibit No. 2. They send it free. It is a large colored chart which shows the manioc plant and the process by which tapioca is made.

4. Working out a play in which the parts are taken by Amazon Indians.

How many scenes would you have? Do you think hunting with blow-pipes would make a good one? Could you make blow-pipes? How about gathering around the family fire and telling the story of the "Turtle and the Deer"?

If you should want to make a play, here are the names of some Amazon Indian chiefs:

Bō ga nă E chü Fôr ï nă Hen a to ba

Here are some more of their words to use:

Gwán ó means mother.

Rin yo sä means girl.

Mō nă means the sun.

Hō mă means monkey.

II

AROUND THE WORLD NEAR THE EQUATOR

FROM the hot wet lands of the world many things are brought to the United States: animals for our zoos, elephants for our circuses, rubber for our automobile tires, mahogany for our tables. Spices, bananas, and coconuts all come from distant lands that are hot and wet all year around. Where are the lands from which we get all these things?

On the large land mass shaped something like a "Horn of Plenty" live the Indians we have been studying. This continent is called South America. Find it on the map following this page. Find it on the globe in your school room.

The continent on which we live is North America. It lies north of the equator. Most of South America lies south of the equator. Find the equator.

The equator is an imaginary line which encircles the globe exactly half way between the poles. If





we were to sail far enough south to cross the equator, we would not know when we reached it. For there is really no line drawn, no mark made around the earth to show where the equator is. We draw a line for the equator on our maps and globes, but not on the earth itself. The captain of our ship can tell us when we reach the equator, because he knows the place by measuring the height of the sun. That is the common way of finding how near a ship is to the equator.

Find on the map where the equator crosses South America. There we see the Amazon River marked. Start at the Atlantic Ocean, enter the mouth of the Amazon River, follow up the river until you reach the Ica River. A short distance up the Ica River is the home of the Indians of our story. Can you find this place on your globe? What things are shipped from there to us?

There are other lowlands near the equator where people must endure constant heat and daily rains. There they fight against swarms of mosquitoes, and other insect pests. And they have to contend with floods and swamps. Find on the globe another continent which is crossed by the equator.

Notice on the map that the Amazon Basin (land

drained by the Amazon and the rivers which flow into it) is marked green. Green on the map means lowland. Find the lowland which the equator crosses in Africa. Do you find the Congo River marked there?

Along the Congo River are great forests much like those along the Amazon. Many animals are found there that do not live in the Amazon forests. Men often go to the Congo to bring back animals for our circuses and parks. Gorillas and chimpanzees from the Congo are to be seen in the parks and zoos of the United States.

GOING TO THE CONGO AFTER ANIMALS FOR AMERICAN PARKS

When men go from North America to the Congo what ocean will they cross? If they leave New York in a January blizzard and wear their overcoats, will they need them when they reach the Congo in February?

Here is a list of some of the things they take with them for their trip in the Congo.

1. Hammocks.

Why are these better than cots?

2. Waterproof tents.

Why are they particularly careful to see that the tents are waterproof?

3. Mosquito nets.

They will be glad to sleep under these. How do the Amazon Indians manage to sleep without nets?

4. Light weight blankets.

When will they use these? How do the Amazon Indians keep warm?

5. Food, khaki suits, matches, films for taking movies of the animals. These supplies are packed in tin boxes.

These boxes are small enough so that a man can carry one long distances through the forest or load it into a canoe. Why is tin the best material for their boxes? What chance will the ants have to feast on the supplies?

Hats such as men wear in the United States are

not the right kind for protection when the sun is directly overhead. Travelers to the Congo take special helmets with them, which are quite thick but of light weight. The helmets are made of straw and the crowns are lined with cork.

These helmets protect the men from sunstroke. They would not think of venturing into the sunlight in the middle of the day without their helmets. People who have grown up in the tropics can stand the strong sunlight without this covering better than white men from the United States can.

Sometimes a Congo traveler will take a small net out of his pocket, put it over his hat, and tuck the ends into the collar of this shirt. This will protect his face from insect bites.

American hunters in the Congo hire natives to guide them through the forest and to carry their tents and other equipment. The natives are not Indians as are the dwellers in the Amazon. The people of the Congo are negroes. The ancestors of the negroes in the United States were brought here from the Congo.

In the picture is shown one of the houses in the village at which the Americans secured guides. How many things do you see here that remind you



© Publishers Photo Service

Congo natives that the hunters hired. The plants growing behind the house are bananas.

of the Amazon Indians? The men in the picture are pounding bark into a kind of cloth.

Perhaps you have seen some of the very animals the American hunters brought back from the Congo. Try making a list of all the wild animals you have seen in a zoo or in a circus. Then see if you can tell which ones come from near the equator.



Courtesy, Field Museum of Natural History

Two good hunters in the Congo whom the Americans hired to help them find chimpanzees. Notice how the leaves are woven back and forth between reeds in the walls of the hut.

GOING TO THE PHILIPPINES FOR COCONUTS

Each year dozens of American ships go to the Philippine Islands after coconuts for us. If you take your globe and follow the equator across the Pacific Ocean, you will find a great group of islands called the East Indies. What two continents are they near? Close to the larger continent you will find the Philippine Islands. On which side of the equator are they? Find the lowlands in these islands. It is there the coconuts grow.

In thatched huts near the coconut groves live Filipinos who gather the nuts for us. They are not black like the people of the Congo nor copper-colored like the Indians of the Amazon. They belong to the brown race. Their huts are built on posts even when they are far from a river. In this way the houses are off the damp ground and insects are not so likely to trouble those who live in them. The Filipinos make the floors of their houses from slats of bamboo. They build their fires under the house in a stove made of stone.

A strong wind blows down many ripe coconuts. Men, women, and children then hasten out to the



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A Filipino taking a load of coconuts to the drying grounds. A water buffalo hauls the cart. Or what are the houses built? Why were steep roofs built?



© Brown Bros.

Filipinos splitting coconuts with bolos.

groves and busily work at picking up the nuts. With their bolos the men split open the great husks. The bolo is their knife.

After the husks are stripped off, the nuts look like those we see in our stores. Cracking the shells, the men take out the meat which they spread out in the sunshine to dry. This drying is slow for the air is very damp. The coconut meat has to be turned over often to hasten the drying.

The Filipinos cover the coconut meat or carry it into the house almost every day when it rains.

After several weeks of drying, it will be ready to load on the steamers for the United States.

The dried meat of the coconut is crushed and the oil taken out. Many nut margarines (butter substitutes) and soaps are made from coconut oil. The fiber from the husks is baled and shipped to the United States. Most of the reddish brown door mats which we use are made from this fiber.

All around the world there are hot wet lowlands near the equator. To us the lowlands seem unpleasant places in which to live. But the people who have always lived in that hot wet climate, would perhaps say our land was unpleasant because to them our winters would be disagreeable. Many things that we use grow in these tropical lands, but will not grow in our country. How many of them can you name?

III

GARDENERS AND SHEPHERDS IN THE NORTHERN SAHARA

FAR off in the northern Sahara, men are working in the hot sun to grow dates for you and for me. These dates are shipped thousands of miles to the United States.

Dates grow where the climate is hot and dry. There are a few small places in our country that are as hot and dry as the northern Sahara. Officers of our government said, "Why do we not grow dates in our own land?" So they sent men to date gardens in northern Africa to find out how dates are grown.

These men brought back many young date-palm trees to plant in our Southwest where it is hot and dry. One of the men brought palms from the gardens of Jerid. (Jerid is marked on the map, following page 46.) He traveled far to get the palms. While there he took some of the pictures in this chapter.

Many of the people in the Sahara have no chance to grow dates. They make a living by raising camels. These shepherds of camels do not stay in one place as the date gardeners do. They drive their herds miles and miles in search of food.

THE DATE GARDENS OF JERID

In one of the date gardens of Jerid the noon-day sun beats fiercely on the desert sand. The Arabs are hurrying from the village on the hillside across the burning strip to the date gardens. No one stops to talk out in the glare and heat of the sun. Those who are riding urge their donkeys to a faster pace. The barefoot boys feel the sting of the sun-scorched ground as they run across the sands.

Soon they reach the garden. Its cool green shade is a great relief. The gentle trickle of water in the canals under the trees is music to their ears. Without this running water there would be no shade and no people could make a home there.

Through the whole garden date palms grow. Some are so close together that their trunks almost touch. High into the hot dry air they lift their heads of feathery green leaves. "The date palm



Courtesy, U. S. Dept. of Agriculture

Three Arabs resting in the shade of the date palms.

lives with its head in fire and its feet in running water," the Arabs say.

Beneath the leafy crowns of the palms hang bunches of ripening dates. Huge clusters, weighing from ten to forty pounds, grow on slender stems. Some bunches are so heavy that it is necessary to support them on the nearest leaf stalks to keep the stems from breaking. The trees you see in the picture are young. They have been bearing fruit only a few years.



Courtesy, U. S. Dept. of Agriculture

A vegetable garden under the date palms.

In the shade of the tall palms grow apricots, almonds, peaches, figs, and olives. Every bit of ground is precious in this rich garden. Even the tiny open spaces among the trees have rows of beans, and peppers with their bright red fruits. Trailing over other open spaces are long runners of cucumbers and melons. Close to the path, vegetables are planted. Some of the gardeners have only half an acre from which they must make a living for the whole family. They can not afford to let any part of their land lie idle, if they can get water for it.

Each owner in the garden separates his plot from his neighbor's by a low mud wall. To every plot run little irrigation ditches through which water may be led. As a visitor wanders along the shaded paths, he sees barefoot boys playing in the water of the larger canals.

BRINGING WATER TO THE DATE PALMS

In the hot desert, man makes his garden where there is a water supply. Such a green spot is called an oasis. If water can be had a garden will grow all the year. It is so warm that there is never frost enough to harm the crops.



Courtesy, U. S. Dept. of Agriculture

One of the springs from which water comes for the gardens of Jerid.

From what source does the water come which makes possible the date gardens of Jerid? North of the gardens is a steep rock cliff. At the foot of it, more than two hundred springs bubble out all the year long. Some of these are salt and some are fresh. Only fresh water can be used for

the gardens, for salt will kill the plants.

At four places along the foot of the cliff there is enough fresh water bubbling up to supply the gardens. In one place there are one hundred and forty springs; fifteen miles farther on, is another large group of springs and a very large garden. Still farther, are two smaller groups and smaller gardens. These four oases are known as Jerid. The water for the gardens is led from the spring through canals. Some of the canals look like small rivers. To see that each man gets his share of



Courtesy, U. S. Dept. of Agriculture

The main irrigation canal in one of the oases of Jerid.

water and no more, guards stand watch day and night.

All along the little ditches, which open from the large canals, dark-skinned gardeners are at work. Here a man with a hoe cleans out a ditch so that water may run where it is needed. Over there another builds a tiny dam of earth across a ditch in order to turn water to another tree. Where little rain falls, men must water their crops in some such way as this. We say they *irrigate* the land.

PROTECTING THE GARDENS FROM SHIFTING SAND

The date gardens of Jerid occupy a narrow stretch of level land just south of the cliff. The cliff shelters the trees from the cool north winds of winter. South of the gardens is a great shallow basin into which the salt-water springs flow. This is called the Shott el Jerid. The hot dry air evaporates the water so rapidly from the basin that only a glittering crust of salt is left. The salt in this basin furnishes all the people need for their food and gives them some to sell. It is only when an occasional rain falls that there is water in the Shott.

To the east and to the west of the gardens are great stretches of sand. The wind whips along and piles the sand into rounded hills which are called dunes. Some of them are much higher than the tallest palm in the oasis.

When the wind blows, sand drifts into the gardens. The Arabs try to keep it out by building mud walls around the oasis. Palm leaves are stuck into the tops of these walls to make them higher.

Sometimes so much sand blows into the oasis



© Ewing Galloway, N. Y.
Noticed the palm leaves stuck into the top of the mud wall around the date gardens. The irrigation ditch runs under the garden wall. The women are on their way to the springs.

that it has to be carried out. Then the workers fill baskets and carry the sand away up on the dunes. This work is generally done at night. It is cooler then and easier to do heavy work than in the glare and heat of the daytime. The fight with the desert sand never ceases. If it does, the desert is the victor and the sand will bury the gardens.



Courtesy, U. S. Dept. of Agriculture

The hillside village of Nefta above one of the oases of Jerid.

THE VILLAGE

When the day's work in the garden is over, the workmen store their tools in the toolhouses. They are glad to start for home, for work in the heat has been hard. Their homes are in the village not

far away. From the cliff we could look down into part of the oasis. If we look across the date gardens, we see the village on the opposite hillside.

Even though the oasis is large, the people do not build their homes in it. All the level land which water will reach must be used for the gardens. The hillside can not be watered easily so it is the place for the village. Every day the gardeners cross the strip of desert sand between the village and their gardens. Some live on the side of the village nearest the oasis. Others walk a long way across the market place and through narrow winding streets.

The village seems a dusty place after coming from the moist oasis. The low flat-roofed houses are set close to the narrow street. The houses are all the same dull color, the grayish white of dried clay. No lawns, no flowers, no trees brighten the view. Without trees, there is little shade. As a protection against the blazing sun, some of the narrow streets are roofed over.

No sidewalks or paved streets are to be seen, but there is no danger of muddy streets in a village on a desert hillside. Men, women, children, dogs, and donkeys all walk in the same narrow, dusty

road. When a donkey with a huge load strapped on each side comes along, his driver has to call, "Look out!" This warns all those on foot to dodge into doorways to let him pass. With his great load the donkey fills the narrow passageway of the street.

The only large open place in the town is the market place. To the market place come the donkeys of the water carriers. Great earthenware jars rest in the framework fastened on the side of the donkey. He is led to the springs where the jars are filled with water. Then the water carrier



Courtesy, U. S. Dept. of Agriculture

The market place. Notice the long loose robes of the Arabs.

leads him through the streets calling out, "Water! Water!"

The richer housewives come to their doors to buy water.

Some women go to the springs with donkeys carrying casks to be filled. The women of the poorer families trudge to the springs with earthenware jars on their heads. What will they do on wash day? Instead of carrying water to the house, the women carry the clothes to the stream which flows from the springs to the garden. They tuck their skirts up to their knees and wash their clothes right in the shallow water.

THE HOUSES OF SUN BAKED CLAY

In the desert, man has few materials to choose from when he wishes to build a house. No trees grow except in the oases, and the date palm is the only large tree there. These are too precious to cut down. They produce food, fiber for rope, leaves for mats. It is not until the palms reach old age that they are felled. Only a few trees are cut each year. There are so many uses for the trunk that the wood is too precious for house building. About the only part of the house which is of wood is the door.

Near some oases good building stone is to be found. Jerid has none, but has a large supply of clay from which bricks are easily made. To make bricks, clay is mixed with water, shaped into blocks, and left out in the sun to harden. When the thick walls are built, they are plastered with mud which bakes hard. In the walls a few small slits serve as windows. The windows are narrow so that they will keep out the sunlight and also the sand which the wind is constantly blowing about.

Most of the houses are only one story high. The sloping roof that is used in rainy countries is not necessary here, because only three or four rains are likely to fall each year. A few desert people do not trouble to build roofs on their houses, but most of them wish a roof for protection against the sun and from the few rains that do fall.

The roof must be strongly built because it is used for many purposes. A few branches and small trunks of old apricot, peach, and other fruit trees are laid across from wall to wall. On top of these, a network of palm leaves is placed. This serves as a support for the mud which is plastered thickly on top. When the roof has baked hard it looks exactly like the walls of the house.



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Where do the workers get the material for house building?

During the hottest time of the year, from June to August, when the sun is very high in the southern sky, the house is too hot for comfortable sleeping quarters. Most of the year the nights in the desert

are cool, even if the days are scorching hot. When the nights are very hot the family take their beds, which are only mats or rugs, up on the roof and sleep under the starlit sky in comfort. In the daytime the temperature rises quickly to more than a hundred degrees, but at night the dry air cools rapidly.

The floor does not give the house builder much trouble, for it is made of dirt tramped hard. On the floor a few mats are laid. In most houses the mats serve as seats. A number of earthenware jars and pots for cooking and for carrying water and storing food stand on the floor. From the rafters hang bunches of dried dates.

THE EVENING MEAL

When the hungry men come home from the day's work, the women of the household have the evening meal ready. It is not the custom for Arab men and women to eat together. The men always eat first. They seat themselves cross-legged on mats. They seldom have any chairs or tables.

On this particular night they have visitors and therefore prepare an extra fine supper. A great

steaming platter of cous-cous is set before the guests. This is a dish we have never tasted. Arabs consider it delicious. Some American travelers who have eaten it report that they like it. This is the way it is made. In the center of the platter is placed a leg of mutton. Around it are arranged barley and vegetables and many red peppers. All of these have been boiled together and highly seasoned. The man of the family cuts the mutton into strips. Then flat cakes of ground wheat are served to each. They roll up the cakes and with them scoop up some cous-cous from the platter in front of them. The little cake serves as a sort of spoon, and the spoon is finally eaten too. A dessert of soft sirupy dates is eaten after the cous-cous.

Making tea for the meal is an important event. An earthenware teapot is filled with water and set over a little fire. When the water boils, tea is dropped in. A large loaf of sugar is placed before the father. With a hammer he breaks off many little pieces and puts them in the teapot. When the tea is as sweet as sirup, it is ready to drink. Each person drinks many cupfuls.

At most meals dates are eaten, not for dessert but in place of bread, meat, and vegetables. A

favorite dish is dates scrambled with eggs. In the United States we eat on the average about one pound of dates apiece in a year. An Arab often eats five or six pounds a day. Some dates which are as hard as nuts they grind up and make into date paste out of which they bake cakes.

THE DATE HARVEST

From August to December the oasis of Jerid is busy with the date harvest. Not all the dates ripen at once, so the picking may last many months. The ripening dates sometimes attract robbers. To protect the precious crop, watchmen are stationed in the gardens all night.

During the day the oasis is thronged with workers. The light thud of the dates as they fall, and the calls of pickers and donkey boys make a strange contrast with the quiet of the peaceful night.

Each man and boy has his own task in the harvesting. One climbs to the top to cut the branches. The climb is not difficult because the trunk is so rough and scaly that their bare feet find many supports. Behind the cutter climb three or four other men. Each clings with one arm around the trunk.

With the other hand he passes down the bunches of fruit.

From many trees fifteen or twenty bunches of dates are harvested. The over-ripe dates fall in a shower as the bunches are passed down from man to man. Only the finest dates are gathered in this careful way. From most trees the bunches are thrown down by the cutter and caught on mats.

All around the trees where the harvesters are at work, boys are picking up loose dates and throwing them into baskets. Men carry the bunches to a central point in each garden. There they are loaded on donkeys, who carry them to storehouses in the village. In the storehouses they are hung from beams. The boys shout "Ir-r-ra!" to the donkeys, and they trot back to the garden for other loads.

Many of the workers are paid in dates. The man who cuts the bunches is one of the best paid. He receives about eighty-eight pounds of dates for each day's work.

Many kinds of dates are grown in Jerid besides those which we see in the stores in America. Some are jet black, some purple, and others golden yellow. The Arabs have strange names for some kinds of dates. One they call "Bride's Finger," another



Courtesy, U. S. Dept. of Agriculture

We may have eaten some of these dates. Notice on the tree trunk the little ledges which the Arabs use in climbing.

is "Pigeon Egg." The Arabian name of one is "Boo Fagoos" which means "father of the cucumber."

The juiciest dates will keep only a short time after they are picked. They are very sweet and soft as butter and are used for dessert. Another kind of date, which is sirupy, is packed in earthenware jars or in goatskin bags. These will keep for some months. Fortunately for the Arab, many kinds of dates will keep a year or more. These need

to be dried and stored away. Some must be dried on the bunch. Other kinds must be picked from the stems and laid out in the sun to dry.

The roof of the house is an excellent place to dry the dates. Up there they are out of the reach of dogs and chickens. Of course a little sand will blow in, but the Arab does not seem to mind that as we would. Since the air is dry and hot, the dates are soon ready to pack. A great supply is stored away, enough to last the family until the next harvest.

Not all the date crop is needed by the people of Jerid. Many thousands of pounds will be sold or traded for other things which they need. The dates which are to be shipped to the United States and to other countries are carefully sorted to remove any spoiled or over-ripe ones. Because they have a long journey to make, the perfect fruits are packed in large wooden boxes. Those which are placed in baskets will be taken to the village.

The boxes to be sold are loaded on camels, and after a day's march the nearest railroad station is reached. A few years ago a narrow-guage railroad was built to one of the oases of Jerid. The rails are only two and a half feet apart. To us this

seems like a toy railroad. Before the railroad came, boxes of dates had to travel many days on the backs of camels to reach the coast. At the seaport the dates are loaded on board ships which sail across the Mediterranean Sea and the Atlantic Ocean to the United States.

NOMADS NEAR THE OASES OF JERID

The date gardeners do not ship to other countries all the dates they have to sell. Many thousands of pounds are kept to sell to their desert neighbors.

Soon after the date harvest begins, caravans of camels come from all directions to Jerid. The nomads of the desert to whom the camels belong are coming to trade for dates. Nomads are people who constantly move about and who have no settled home. These desert wanderers have no gardens of date palms; but they have wool, hides, fat-tailed sheep, goats, and camels for which the people of Jerid will trade dates. While they are in Jerid the nomads can also secure small supplies of tea, sugar, cotton cloth, and other things which have been brought there on the railroad.

One day a group of nomads arrives at Jerid just

before sundown. They camp for the night on a sand dune outside the oasis. The camels are unloaded and their saddles and loads are piled in a large circle. Inside of this circle the camels are led. To keep each camel from wandering away, its knees are tied together. The camp is a noisy place while the camels are being unloaded and tied. They groan and snarl and bite. When they are fastened securely, small fires are built and the nomads cook their suppers. Wrapping themselves closely in their woolen robes they lie down on the sand to sleep. Above them is a roof of dark blue sky set with thousands of glittering stars.

THE DATE CARAVAN ON THE MARCH

On the morning after the trading is finished the date caravan leaves Jerid. By sunrise the long train of heavily-laden camels is on the march. The morning air is very chilly so the men pull their loose garments closely about them. They wrap their burnooses around their shoulders. Burnoose is the name they give to a large woolen robe. When they have traveled a few hours it becomes quite warm and they loosen their burnooses. By the middle



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Arabs praying to Allah on the Sahara.

of the day they are glad to take them off and fasten them to the camels' packs.

The Arabs are in a great hurry to get back to their tribe. They have left their families encamped near a small oasis. Their flocks of sheep, goats, and camels are feeding on the grass bordering the oasis. They know that the pasturage there will not last long. To save time the traders do not stop at noon to prepare a meal. Instead they munch a handful of dates as they march along. Steadily until sunset they travel on. Even though the march has lasted for twelve hours the caravan has gone only twenty miles, for camels are slow travelers.

The second day starts out well, but about noon-time the camels stretch their necks and sniff high in the air. The drivers know what this sign means. Trouble is ahead of them. Far off on the horizon the blue sky turns to a brassy yellow. Quickly the men try to hobble the groaning camels. In the confusion some of the water bags are burst and the precious water disappears into the sand. There is a rush to save the rest of the water bags.

Before the camp is made ready, the dreaded sandstorm of the desert is upon them. Great whirls of sand are carried by the wind and sweep over

men and camels. The camels turn their tails to the wind and lie down huddled close together. The men wrap themselves in their burnouses to protect their faces from the cutting sand. Holding tight their goatskin bags of water they crouch in the shelter of the camels' bodies.

All night the dry windstorm rages. When the wind goes down in the morning, the Arabs drag themselves out of the sand. They straighten the loads on the camels' backs and lead them into line. Two of the camels which they were not able to hobble before the storm caught them, have disappeared, carrying some of the precious water bags with them. The Arabs look over the whole caravan and find that half the water bags are gone or broken. This means they can have only one drink of water a day. For the rest of the journey they suffer greatly with thirst.

On the afternoon of the fourth day the leader sights the oasis miles ahead. This means water to the travelers. The men are more anxious to hurry than are the camels. Four days without water in the cool part of the year is no hardship to a camel.

On the next page is a picture of the caravan as it nears the oasis. See the great bags the camels



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The date caravan.

carry. Many of these bags are filled with dates. A few packs contain other things for which they traded at Jerid,—yards of cotton cloth, pounds of tea, salt, beans, and sugar. A rope is tied from the halter of one camel to the tail of the camel in front. This is to keep them in line, as there is only one driver for every four or five camels.

Do you see a man with a burnoose over his head? He is probably wearing it this way to protect his head from the sun. The men in this caravan are

bare-footed. If this were a picture of a caravan traveling in the hottest time of the year, the men probably would be wearing sandals to protect their feet from the burning sands.

ARRIVAL AT THE OASIS

The caravan reaches the oasis and the tired camels are unloaded. They are led to the well, where water is hauled up in leather buckets. The watering is done carefully because a camel is likely to drink too much when given water after a four days' thirst. The boys then drive them out to the scanty pasture.

Glad are the travelers when the evening meal is ready. Not much cooking was done on their journey, for they lost a large part of their water supply during the storm. Little fuel was to be had because freshly drifted sand had covered the small dry brush which they use for fires.

The women bring in wooden bowls full of curds. The Arabs use much sour milk. They can not keep milk sweet long in this hot land. As a treat for the returned men, a sheep has been slaughtered and now a great piece of boiled mutton is set before them.

This tribe slaughters very few animals for meat. The chief food which the goats and camels furnish is milk. Some of the young animals each year must be kept to increase the herds and to replace those lost in the sandstorm. Most of the rest are traded for dates, barley, wheat, cloth, rifles, and other necessities.

THE CAMEL

The nomads raise camels, goats, sheep, and donkeys. They must choose animals that can get a living on the sparse grass and scrubby plants of the desert. Camels can stand the hardships of the desert better than any other animal.

In the hot dry Sahara few plants grow and these are quite different from the plants which we know. The clumps of sharp wiry grass are far apart. There is not enough water to support a mat of grass which would cover the ground. It is hard to believe that any animal can find enough to eat where there is so little grass as in the desert. The low scrubby bushes are tough and thorny. The camel is able to eat this rough forage because his thick lips are covered with heavy skin. Even a patch of



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Notice how far apart the tufts of desert grass are.

prickly-pear cactus with needle-like thorns vanishes when camels get into it.

Often the pasturage is very scanty and there may be days at a time when the camel finds little to eat. But when he is on good pasturage he raises a fine fat hump. When he has to go without food he uses up the fat stored in the hump. The sheep that these nomads raise have a storehouse for fat, too. The

sheep's storehouse is his tail. Because his tail gets fat the animal is called the fat-tailed sheep.

Because the camel can go long without food or water it can be used for long trading journeys. Sheep, goats, and donkeys can not travel far without pasturage. The camel's hump enables him to go long distances with little to eat. The fat stored there nourishes him.

If camels travel far along a route where feed is scarce, the Arabs often feed them dates, date stones, and even the straw stuffing of the saddles. One can tell when a camel has gone a long time without much to eat. His hump becomes thin and flabby. If we were selecting a camel for a long journey we would examine the hump carefully.

There is another reason why the camel is best for long distance journeys. He carries his water bottle with him. His stomach is so made that he can store water enough to last him for several days. Before starting on a long journey the camel drinks as much as ten gallons of water. He can then easily go three or four days without a drink. He has been known to go ten days without water, but that is very hard on him. He suffers greatly.

Large padded feet enable the camel to walk easily

over the sand. If a bad storm comes up he can close his nostrils for a long time, then he opens them and takes a quick breath. To protect his eyes from the sand he lowers a transparent inner eyelid.

The camel is very strong. Three hundred pounds is just an ordinary load. Sometimes he carries as much as five or six hundred pounds. If the camels are carrying something they like to eat, the Arabs muzzle them to keep them from touching the loads.

A caravan of camels does not travel fast, but it can make twenty miles a day and keep it up day



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These camels must be carrying something they like to eat.

after day. The camel is the only animal which can carry heavy loads and travel long distances in the hot desert. The "ship of the desert" is a name he well deserves.

Not only are camels the carriers for desert dwellers who live far from railroads, but they also furnish milk to drink and from which to make cheese. Their hair is woven into tent cloth and into rugs. Some of the hair is shipped to this country, where it is made into camels-hair-cloth out of which expensive coats are made. Camels' hair is used for artists' paint brushes. Camel hide is used by the desert dwellers for saddles, sandals, and a score of other things.

For desert peoples far from railroads to get along without the camel would be difficult. Yet the camel has his faults. His temper is not the best. Scarcely an Arab makes a pet of his camel, for the camel is likely to be sullen and cross. If any one gets too close, he snaps and snarls. This is not altogether his fault, for the drivers are often rough and cruel in their treatment. The camel is so solemn that the Arabs try to account for his split lip by this riddle:

"Why has the camel a split lip?"

"Because once, just once, a camel tried to laugh."

MOVING TO NEW PASTURE

The camels which have made the trip to Jerid are tired and somewhat lean. Their humps are small and flabby. The sheik decides to wait two more days before the tribe moves to new pastures. A sheik is the head or ruler of his tribe.

Early on the morning of the third day, long before the sun is up, the nomads are busy breaking camp and getting packed. The tents stand just on the edge of the oasis. The men are driving in the camels, which have not strayed far from the tents. They had been hobbled the night before.

Women are taking down the tents and rolling them up into bundles. Boys are at the well filling goatskin bags with drinking water. At one side of the camp a group of small children is watching a little baby camel stumble about. It is only a day old.

When the camels have been rounded up, they are driven to the well. Each camel drinks deeply. After they have been carefully watered they are led back where the tents lie ready to be loaded. Several boys have been busy stuffing saddles with



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The well at which the nomads get water for the stock.

fresh straw, so that they will not rub the animals' backs.

A jerk on the halter makes the camel go down on his knees and the saddle is placed on his back. Loading him is hard work, because the loads on each side have to balance exactly. As the loads are being packed securely on their backs, the animals groan and grunt and wheeze their objections.



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This building has furnished a little shade in which to pitch the tent.

The nomads live in tents, which are easy to set up, take down, and pack. If people are going to move every few weeks they do not burden themselves with much furniture, so there is little furniture to load. The furnishings for their tents consist of rugs, sheepskin mats, leather pillows stuffed with wool. Nothing breakable can be carried safely around with them. Wooden bowls, a few kettles, and a leather churn are all the utensils they possess.

When the tents and all their household possessions are packed, a supply of food is loaded. Only food that will keep well can be carried when people travel about in a hot country. Dried dates, beans, and barley are packed in goatskin bags, which are strong enough to stand the jouncing on the camels' backs.

When all the other loading is done, each family straps on the camels' backs five or six skin bags of drinking water. One camel is loaded with large nets of hay for the sheik's horse. This camel looks like a "great mattress stalking on stilts." The horse can not eat the scrubby plants that camels, sheep, and goats eat, so feed has to be carried along. Now we see why there is only one horse and why the sheik owns him.

The women and small children ride on camels. Even the little baby camel is carried in a sort of hammock which is slung on its mother's side. Some of the boys are mounted on donkeys.

At last the tribe is all ready to move. The sheik rides ahead on his horse. In place of a hat he wears cloth wound about his head into a sort of turban. A large piece of the cloth hanging loose protects the back of his neck from the burning sun.



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Nomad shepherds on their way to a new pasture.

When a strong wind blows the sand, he wraps the cloth about his face so as to protect it. On foot are men who drive into line the loaded camels. Behind follow sheep, goats, and young camels. Men walk on either side of the herds keeping careful watch over them, for these are the only wealth owned by the tribe.

How do the nomads know where there is grass and water and how do they find their way over the desert waste to new pastures? They know all the watering places in that part of the desert over which they roam, but pasturage is not so certain.



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How can people find their way on such a sandy stretch as this?

Other nomads may have used up a certain pasture by the time our tribe reaches it, or the rains may have failed. This would mean no grass in a place where they were accustomed to find good pasturage.

A little rain in a hot desert causes grass to spring up quickly. Do not think that in a desert it never rains. True, there are some deserts in the world where several years go by without a drop of rain falling. In those deserts there are few nomadic

herdsmen. But in the northern Sahara five or six inches of rain usually fall each year.

An Arab herder will ask the passing caravans, "Has rain fallen anywhere along your route?" If he gets a report of showers near by, he moves his flocks at once to the promised pasture.

How can nomads find their way? If they are in a sandy stretch of the desert there are no roads to guide them. The shifting sands soon cover any traces that have been made by passers-by. Even the surface changes, for the wind scoops out sand in one place and heaps it up in others. The sheik



© Brown Bros.

The sheik.

riding ahead must guide himself by the sun in the daytime and by stars at night. No clouds interfere to hide the sun and stars.

On rock deserts it is not difficult to find the way. For over such a desert there are fairly well marked trails along

which caravan after caravan has passed.

When the tribe is on the move the sheik rides ahead to spy out pasture and to warn against possible danger, for desert travel is not always safe. Many nomads live by robbing passing caravans. Traveling in the northern Sahara is not so dangerous now as it used to be. The French have mounted police who help to control the desert thieves and protect travelers.

Checks

1. From this list make out a menu for an Arab meal.

beefsteak	dates
monkey meat	manioc bread
cous-cous	pineapple
potatoes	beans
pie	lettuce
bananas	sour milk

2. Copy and fill in the blanks with one of the words below.

The shepherds of the desert had traveled many days in search of——.

sand
water
grass

At last they came to a good supply and decided to put up their——

log-houses

tents

umbrellas

and stay a while. Here was enough pasture to feed their——

camels

pigs

sheep

cows

for several——.

years

days

months

weeks

When their dwellings were set up the women drew some water from the——

river

faucet

ocean

well

and prepared supper.

3. Copy this list of things and draw a line under each word which stands for a thing used by the Arab of the Sahara.

sun-baked brick	ice-cream
coal	cheese
gasoline	leather water bags
palm leaf mats	fish
wool	camel meat

4. Place in the proper columns the words below.

	Oasis dwellers	Wandering Shepherds
How they make a living		
Houses		
Food		
What they have to sell		

lumbering	pork
sun baked mud	fresh dates
skin tents	dried dates
gardening by irrigation	potatoes
camel hair	sour milk
wool	herding camels and sheep

5. The Arabs can raise dates only where there is

snow.

sand.

enough water for irrigation.

rain every week.

Things You Might Be Interested in Doing

1. Suppose you were planning to spend the month of December in Jerid. Write a letter to a friend in your grade telling what clothes you expect to take with you and asking his advice upon your selection.
2. Look on the covers of the boxes of dates in your grocery store to see if you find any pictures which remind you of the desert. Do you find a brand called Dromedary Dates? Dromedary is a camel with only one hump.
3. Ask your teacher to write a letter to Hill Brothers, Beach and Washington Streets, New York City, asking them for a little booklet about dates. They send this booklet free to schools.
4. Read, *With Azir Girges in Egypt* (by W. S. Perry, published by Atkinson Mentzer & Company, Chicago). You will find it an interesting story about a little boy who drives the donkeys for travelers who come to see his desert country.
5. Do you look at the picture section of the Sunday papers? There are many pictures in it

which are worth bringing to class. Not long ago we saw a picture in the Sunday paper of an auto on a trip across the desert. Many good pictures are to be found in *The National Geographic Magazine*, and in the magazine called *Asia*.

6. If you know where there are volumes of the *National Geographic Magazine* look in the number for January, 1914, pages 1-132, for pictures of the Sahara. The *National Geographic Magazine* for April, 1924, pages 415-422, has beautifully colored pictures of Jerid and the country near there.

IV

ACROSS THE SEAS TO OTHER DESERT LANDS

THE place in the United States where date palms from Jerid were planted is just as far north of the equator as is Jerid. To find this place we need to know how to measure distances from the equator.

The world is so large that it is difficult to measure its great distances in miles. Therefore we shall use the measure which is used by sailors on the high seas.

Since they have no landmarks to guide them, the sailors must reckon their location by measuring the height of the sun and of certain stars. The height of these bodies above the horizon changes as one travels farther and farther from the equator. By observing the height and figuring from long tables of measurements, the sailors find how far they are from the equator. They count this distance in *degrees*, not in miles.

From the equator to the south pole or to the

north pole is ninety degrees. One-third of the way from the equator to the pole is one-third of ninety degrees or thirty degrees. One-half the way is forty-five degrees.

On the globe you will find lines which run around the earth in the same direction as the equator. These lines are called parallels because they are everywhere equally distant from the equator. On these parallels the degrees are marked.

On the map, following page 46, do you find a line crossing Africa just south of Jerid? How far from the equator are all places on this parallel?

To find where in the United States date palms were planted, follow from Jerid on the parallel of thirty degrees until you reach the United States. You can do this in two ways, that is, by going in either one of two directions.

If you go the shorter way what ocean do you cross? If you go the longer way what continent do you first cross, then what ocean?

Do you find the Colorado River in the United States? The mouth of this river is just as far from the equator as is Jerid. Near the mouth of the Colorado River is a desert. The date palms were planted in an oasis in this desert.



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An orchard of young date palms near the mouth of the Colorado River. Why is there a ditch in the orchard?

Jerid is not the only place where men collected date palms for the United States. From several other deserts palms were brought.

If we follow parallel thirty from near the mouth of the Colorado River across the United States and then across the Atlantic Ocean, we are going east. Keep on going east across northern Africa until you reach the Nile River.

Opposite, you see a picture of date palms growing beside the river. Off in the distance do



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Date palms watered by the Nile.

you see the Pyramids? This land, called Egypt, is famous for these wonderful tombs of kings. These great Pyramids have stood there ever since the times of which we read in the Bible.

Now let us go east on parallel thirty a little farther and we shall come to Arabia. From there, too, date palms were brought.

These parallels are good guides to follow in pointing out directions east and west. If you stand on a parallel, facing the north pole, your right hand is toward the east and your left hand is toward the west. This is just the same as it is in your schoolroom when you face north, east is always toward your right.

From Arabia go straight west to the United States. What ocean do you cross? From Arabia go straight east to the United States. What ocean do you cross?

In your schoolroom point in the direction you would travel should you go to the Atlantic Ocean. Trace the route on the globe. What direction is the Pacific Ocean from us? Point it out on the globe.

Not every desert in the world raises date palms. Some have frost for several months during the winter, others are hot enough but there is no water

to spare for gardening. There are still other deserts which could grow date palms, but few trees have been planted there.

To find one of these deserts from which no dates are shipped, look on your map and find parallel thirty degrees south of the equator. All the places that are on this line are one-third of the way from the equator to the south pole. The lowlands on this parallel are just as hot as the lowlands on the parallel of thirty degrees north of the equator.

Trace along on the parallel thirty degrees south of the equator until you come to a small continent, Australia. There you see a desert marked. At a place in this desert men found gold. People went there to mine it. How would they travel across the hot desert stretches to the gold fields? They went exactly the same way that the nomads near Jerid travel to-day. What did these miners do for food and water? They were dependent upon camel caravans coming hundreds of miles across the desert with supplies for them.

Soon it was found that it would pay to build a railroad into the gold fields of Australia. This was a very difficult road to build. All the water and food for the workmen had to be brought in by cara-

van. When the road was finished, water was brought in tank cars. Finally a pipe line was laid to bring water three hundred fifty miles from the mountains. When all the gold is mined, few people will stay near the abandoned mines. Only a few will be able to earn a living there. It is too expensive to bring enough water three hundred and fifty miles to irrigate much land for the raising of food.

Not every lowland on the thirtieth parallel either north or south of the equator is a desert. But every lowland at this distance from the equator has long, hot summers and short, warm winters.



© Ewing Galloway, N. Y.

El Misti, a famous mountain in the land of the potato.

V

MOUNTAIN SHEPHERDS OF PERU

FAR up in the highlands of Peru, near the equator, is the place where the potato first grew. More than a thousand years before Columbus discovered America, Indians in Peru were raising potatoes. At that time the rest of the world had never tasted a potato.

It is less than five hundred years ago that potatoes were carried to Ireland. Now they are such an important crop in that country that we call them Irish potatoes. If we named the potato after its home land, we should say Peruvian potatoes.

Up in this highland home of the potato live mountain shepherds. They eat potatoes three times a day—boiled potato, potato soup, potato mush.

On the map of South America very near the Upper Amazon, the home of the Indians of "Potato Land" is marked with slanting lines like this: /////. The brown color on which the slanting lines appear means mountains on the map.

You see that these people live south of the equator. Therefore, they have their coolest weather in June, July, and August. Their warmest weather comes when we have our winter.

A DAY WITH THE SHEPHERDS

Early this February morning, high up in the Andes Mountains the flocks of one of the shepherd families are being driven out to pasture. The chilly air of the summer morning makes the animals frisk along. Soon they leave the sheltered hollow near the



Courtesy, Col. Hiram Bingham

On a highland pasture in the Andes.

house. The father and the boys wrap their ponchos tightly about their shoulders as they hurry after the animals. A poncho is a woolen blanket. An opening in it permits it to be slipped over the wearer's head. The poncho serves well as an overcoat.

The herders and their flocks move briskly up the path which leads to the mountain slope. Soon they come out of the valley and on to a stretch of flat-tish land. After passing a potato field, they stop for a short time to let the flocks graze.

As the sun gets higher, the chill of the air dis-



Courtesy, Col. Hiram Bingham

The white animals with ears perked up are llamas. The black ones with shorter ears and big ruffs around the necks are alpacas.

appears. Gradually the shepherds work their herds up the mountain-side, zigzagging across the steep rocky slopes. Ahead of them and high above them rise the great mountain peaks with their everlasting caps of snow. The few plants scattered over the slope do not invite the herds to stay very long in one place.

All day the herdsmen follow their flocks about. The llamas eat off the coarse upper leaves of the plants. The sheep nibble the tender lower shoots. The alpacas, who are difficult to please, hunt out

the tenderest grass of all. Llamas and alpacas are animals that most of us have never seen. We do not raise them in the United States, because we have no high mountains close to the equator. High tropical mountains are the home of the llama.

The llama is a peculiar animal. He is a close relative of the camel, though he has no hump. He carries his head so high that he looks as if he had a stiff neck. He spits at any one who tries to pet him. Though he is not very friendly, he is very useful. The llama can live on the poorest fare and find his way up or down the steepest mountain trails. The mountaineers of the Andes could not get along without him. He carries all their burdens, but he refuses to budge if they load on too much.

Quite different is the alpaca. He is not a burden bearer, but he brings in money by the sale of his coat. His long, fine, silky fleece is valued all over the world. We might count ourselves fortunate if some day we could have a soft alpaca wool coat. The alpaca has an abundance of wool; it falls into his eyes, and reaches right down to his hoofs. The man who took the picture on page 112, said the alpaca reminded him of a woolly-dog in a toy shop.

Herders on the Andes carry no watches, but they

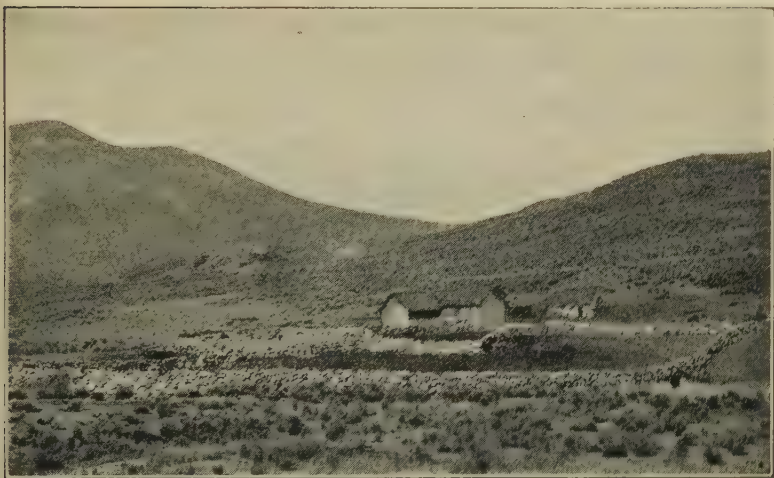
know by the sun when it is noon. At this time of the year the sun is directly overhead at twelve o'clock. By the middle of the day the herders have loosened their ponchos, for it is warm and pleasant in the sunshine. Their lunch of cold boiled potatoes is spread out on a big granite boulder. After eating, the father and the oldest son play their flutes as they walk along behind the herds.

About two o'clock the wind begins to blow harder than ever. The shepherds pull their felt hats down tightly on their heads. Over their ears they draw the flaps of the tight-fitting woolen caps they wear under their hats. Quickly they begin to gather their flocks together, for they know that a bad storm is about to break.

Before the flocks are rounded up, great hailstones begin to pelt down. The hurrying animals are driven into a narrow ravine. There they huddle together under the shelter of the steep, rock walls.

In an hour the storm is over and the flocks are driven out again to the pasture. Soon the herders turn their flocks toward home and the animals graze as they move slowly down the slope.

About half-way home, the shepherds come to an especially fine patch of tola bushes two or three



Ogilvie: *Geography of the Central Andes*. Courtesy, American Geographical Society

The home of the Indian shepherd. Notice the stone fence of the corral. Stone is the material most easily obtained here.

feet tall. This is their best fuel. They gather great bundles which they strap on two llamas to carry home. These shepherd Indians live up above the tree line on the mountains. Fuel is very hard to find. The tola bush burns well and they gather it whenever they find it.

It is nearing sundown when the Indians reach home. In the stone corral where they drive the flocks for the night, they find several rosy-cheeked children playing ball. Their balls are made of wool which the father has sheared from the sheep.

The animals are not frightened, for they have found the children there night after night on returning from the pastures. This is the children's playground.

A high mountain valley is a very lonely place for a home. These mountain children have no near neighbors with whom to play. It is half a mile up the valley to the nearest house, and a mile and a half down the valley to the next neighbor's.



Courtesy, Houghton Mifflin Co.

Plowing a potato field in the Andes.

THE POTATO FIELDS

Raising potatoes high up in the mountains is very different from growing them in level fields in the United States. Soil in the mountains forms but a thin layer over the rocks. On steep slopes there is no soil at all because the rains wash it down as fast as it forms. On some of the level places there is soil enough to grow potatoes. But some of the places where there is enough soil are too high and too cold for any crop.

The plows with which the mountain shepherds break the sod are very simple. We would call them spades, but the Peruvians call them foot-plows. The men with their foot-plows pry up the sod. The women on their knees in front of the plowmen turn over the clods as they are loosened. In the holes that are made the potatoes are planted, and the fields are then left to do their best without any further care or cultivation.

Potato crops planted by these Peruvian Indians are said to be grown higher up than any other crop in the world. The fields are almost three miles above the level of the sea. Crops will grow at this

height only near the equator where the sun is nearly overhead all the year. Pike's Peak is as high as these potato fields of the Andes, but it is far too cold to grow potatoes or anything else on Pike's Peak.

The potato growers of Peru can not expect a very fine crop. Rain enough falls but there is a light frost every few nights. The days are never very warm. The soil is poor and the fields are never cultivated. The potatoes are sure to be few and small and bitter; we would think many of them scarcely worth digging. These mountain people have such a hard time raising anything to eat that they save every tiny potato.

Three shepherd families who live in this mountain valley have one potato field together. One morning in April the harvest begins. After the potatoes are dug, two or three weeks are spent preparing them to be stored away. In April there are heavy frosts almost every night. The women spread the potatoes out on a hard level piece of ground and leave them all night to freeze. In the morning while the potatoes are thawing, the men trample them to loosen the skins. After freezing, thawing, and trampling every day for a week or two, the



Courtesy, Col. Hiram Bingham

Making churo.

potatoes are dry enough to store away. Dried potato is called *chuno* (pronounced choon-yo). Chuno is light like cork. Stored in homespun woolen bags it is hung in the houses beneath the roof, where it will keep for years.

WORKING AT HOME

One day the Indian boys go out alone with the herds. Their father stays at home to work on a llama skin which he has tanned. He stretches the skin tightly over a board and wedges one end of



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A Peruvian Indian at work on a llama skin.

the board into a heap of stones to hold it firm. With a llama bone he scrapes and rubs the leather to make it soft. When he has finished this, he will make sandals for the little girl who is watching him and for the boys. From the leather that is left he will cut straps for fastening loads on the llamas.

Near the house the mother is grinding some grain which the father bought from a farmer far down the mountain side. The grinding is done in a sheepskin bag by pounding and rubbing it with a



Ogilvie: *Geography of the Central Andes*. Courtesy, American Geographical Society

Grinding meal for dinner.

heavy stone. The mother prefers to work out in the sunshine as it is pleasanter there than in the house. Fuel is so scarce and so much work is needed to gather it that keeping the house warm is difficult. Besides, it is rather dark to work in the house since there are no windows.

When the mother has finished grinding, she picks up the bag of coarse meal and the jar of spring water which one of the children has brought her.

With these she goes into the house to cook the dinner. In one corner on the clay floor she builds a fire in a little stone fireplace. Over the fire she places the kettle and in it cooks the crushed grain into a sort of mush.

The furniture for the home is very simple. It was all made by the owners. The beds are benches built of stone and covered with ponchos and sheep skins. Niches in the wall are used for shelves and tables. Piles of sheepskins on the floor serve as chairs. Scarcely a bit of wood is used either in making the furniture or building the house. Whatever wood they have must be carried long distances up the mountain slopes on the backs of llamas, for trees do not grow at this height.

The outside of the house is as plain as the inside. The walls are of stone, plastered with mud. The roof is thatched with grass, which is tied on with a grass rope. The ends of the rope are fastened to pegs in the walls. Because of the strong winds which often blow, the owner knows that he must tie his roof securely or it will be stripped off.

At one of the other homes in the valley, both the father and mother are busy making pottery. They mix clay with water and mold it into jars which

are set out in the sun to bake hard. Later they will pack a few of the jars inside great bags of wool and load them on the llamas for a trip to the fair. The trip down the mountains is rather a dangerous one but the jars are packed so carefully that but few break on the way.

These shepherd families make most of their own clothes from the products of their flocks. The neighbor a mile and a half down the valley is weaving a poncho. He has plenty of wool from his own flocks of sheep for the weaving. His wife spun the wool and dyed it for him. For the dye she made beautiful colors from the plants which grow on the plateau.

Other shepherds farther down the mountain sides keep flocks of sheep and weave ponchos. There, too, the workers are glad to stay out-of-doors in the sunshine. In the picture on page 124 the man's wife is spinning him a fresh supply of yarn. She has no spinning wheels, but twists the wool threads in her hands. The weaver who sits on a sheepskin mat has fastened the loom around his waist in order to keep it stretched tight.

On the rack in front of the house hangs a gaily striped poncho which he has just finished. Several



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Weaving a poncho in the Andes of Peru.

skins are hanging beside it. Perhaps he plans to make sandals out of one of them. He and his little boy are wearing store shoes. The mother is barefooted. She may have a pair of sandals made after the weaving is done.

We may judge that the weaver must be well-off, for he has a wooden chair, a door, and several wooden posts. All this wood had to be carried up the mountain on the backs of his llamas. Though wood is scarce here, these people do not have such hard work to get wood as do the mountaineers higher up the slope.

GOING TO THE FAIR

In May the dry season has begun and the big fair of the year will be held in the town below. The fair is always held during the dry season. The herdsmen can not bring down their stores of alpaca wool during the wet season. In rainy weather the steep mountain trails are slippery and unsafe.

For weeks the whole family look forward to the trip to the fair. Since they live far up in the mountains with no near neighbors, it is a great treat to go where they will see crowds of people. They are rather glad, too, to have a chance to get down where it is a little warmer. May and June are quite chilly months in their highland home. They have many things ready to sell at the fair and there are articles which they want to buy.

For several days before they go, the three families are busy getting ready. Bags of alpaca wool are packed. From the stores of chuno they take a supply for the trip. Two of the families decide they have some chuno to spare, so they pack two woolen bags full to sell. In neat rolls they tie up the ponchos they have woven. In bags of sheep's wool they pack four jars which they have for sale.

The best looking llamas are carefully washed and combed. These herders are so proud of some of their animals that they wish to enter them for a prize in a contest at the fair.

Some of the younger children are to go to the fair this year for the first time. They are much excited over the trip, because they have heard many stories of the wonderful things which may be seen there. Two of the mothers are going. One of them has a small baby which she will carry in a shawl on her back. The older children will stay at home to look after the alpacas, sheep, and baby llamas.

Early one morning all start down the mountain side with a long train of loaded llamas. The town where the fair is to be held is only five miles away if one could go straight as a bird flies. However, to reach it men must travel twenty miles by the crooked mountain trail. For the travelers must wind around in mountain valleys to find places which are not too steep to travel down. They will have to find breaks in the mountains through which they can go. These breaks in mountains are called passes.

When they are nearing one of these passes, the travelers see ahead two pack-mules and a horse.



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A pass in the Andes Mountains. Notice how narrow the opening between the great cliffs is.

The horse is tied close beside a giant cactus, while the rider has gone over to the mountain stream to get a drink. This man can not be going into very steep places or he would not have a horse. Donkeys and llamas are much more sure-footed than horses on steep mountain trails.

Late in the afternoon the Indian travelers have gone so far down the mountain that they pass fields where wheat and barley are stacked to be threshed. The children do not know what wheat is and they never have seen ripe barley, for grains will not ripen, up where they live.

In one field men are carrying sheaves of wheat to be threshed. The loads they carry are so large that they almost hide the men. The mountain fields are very rough and wagons can not be used to haul the grain.



Courtesy, Col. Hiram Bingham

Carrying the sheaves of wheat.

The children are curious to see what will be done with the sheaves.



Courtesy, Col. Hiram Bingham

Threshing wheat in Peru.

They coax their fathers to take them to the threshing floor. There four oxen are being driven back and forth over the grain until the kernels are separated from the straw. The oxen are all fastened to one yoke. No one of them can reach down to eat the grain unless the others happen to try it at the same time. After the wheat is tramped out, the threshers separate it from the chaff by tossing the mass of chaff and grain into the air. The wind blows the chaff away and the wheat falls to the ground.

To us this seems a strange way to thresh grain in these days of threshing machines. But there is no railroad to bring freight into these highest val-

leys. Everything has to be carried in on the backs of llamas or donkeys, so we see that a threshing machine is impossible.

Besides, the fields are so small that it would not pay a farmer to own a machine even if he had money to buy one. Several farmers could not own one machine together, because they could not move it from one farm to another over the rough, rocky trails.

After the travelers leave the threshing floor they soon get down into warmer levels where they pass



Courtesy, Houghton Mifflin Co.

Cattle finishing up a small field of corn.

fields of corn. In some of the fields the corn has been cut for fodder. The cattle are feeding on what is left. This far down the mountains it is possible to raise cattle because the climate is so much milder that farmers can grow things for cattle to eat. Cattle could not find enough to feed on, up where the llamas and alpacas pasture.

On the second day of the downward trip a wider part of the valley is reached. The travelers come to a little village close against the cliff. All the good flat land on the floor of the valley is laid out



Courtesy, Col. Hiram Bingham

A patchwork of little fields on the valley floor. Terraces
on the hillside.

in small fields. The villagers have even made use of the steep mountain slopes by building terraces. On the hillside they built low stone walls and filled in behind with soil carried from the lowland.

These deep warm valleys do not receive rain enough to grow their crops. Therefore the people who live there have to irrigate their fields. The floor of the valley can be reached by canals from



Courtesy, Col. Hiram Bingham

A team patiently waiting for the plowman.

the river. The terraces can be irrigated only by water from some stream or spring above them.

Down and down our herders travel until the red-tiled roofs of Huancayo (wan-ki'-yo), the town of the fair, come in sight. About a quarter of a mile before they reach town, they pass a field where an ox-team is hitched to a plow. The team is waiting for the plowman to come back and take hold of the single handle of the plow. As the herders stop for a moment to rest they get a beautiful view of the mountains down which they have come.

Just as the edge of the town of Huancayo is reached, they meet trains of mules laden with sugar, oranges, peppers, coffee, and wood. The mules have climbed from the hot valleys below to bring these things to the fair.

A few minutes later the herders come to a stop; their journey is at an end. It is just sundown, so at once they rent tents in which to sleep. The hungry llamas are fed with some of the barley hay brought from home. The travelers are too tired to do any sight-seeing so they spread their ponchos on the floor of the tent and are soon fast asleep.

THE FAIR

Next morning bright and early all go to the market. The fair is held in the business streets of Huancayo.

Before the shepherds take time for sight seeing or play, the things brought with them must be sold. The alpaca wool is carried to a dealer. After examining it carefully he buys it at a fair price. The chuno is harder to dispose of. Finally it is sold to a group of men who are going to the mines.

Two ponchos are sold to a man from the United States who is looking for something to take home with him. This man has been managing a copper mine near by. Doctors have advised him to go back to the lowland because he has had much trouble with mountain sickness. This is an illness which many people have in high mountains because the air is very thin.

The mountain shepherds go to the pottery dealer on a side street and find him seated out on the cobblestone pavement with all his wares about him. After bargaining with him for an hour, they sell him three of the earthenware jars they have brought. They had hoped to sell four, but on the



Courtesy, Col. Hiram Bingham

The pottery dealer displaying his wares at the fair.

way down one of the llamas stumbled and broke the fourth jar.

Late in the afternoon, they come back to the main street where most of the buying and selling is being done. Little stands out in front of the buildings are carrying on a thriving business. Canvas awnings protect the merchants and their wares from the glare of the sun. Up and down the street move throngs of men, women, and children. Every one seems to be having a good time buying or selling. A constant hum is heard on every hand. Out in the middle of the street two donkeys are so



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A busy street in Huesayo during the fair. This does not look like a winter street, but it is no more winter weather as they ever have.

heavily loaded with grass that they are almost hidden. Most of the men and women wear ponchos. Even though it is warm in the sunshine, it is cool in the shade.

Here and there in the crowd are men from the coastal cities of Peru, who have come up to buy alpaca wool. Huancayo is not difficult to reach, because a railroad has been built to it from the coast. Over this railroad, a train comes in three times a week.

First of all the children want to stop at the bread sellers. The little flat biscuits made of wheat flour are a great treat to them, because they have no wheat bread at home. They take the biscuits which they buy and go to one of the lunch counters where cooked corn is being sold. The children have never had any corn on the cob before. Eating this corn would be strange even to us who are used to sweet corn. The ears are small and the kernels are so large and so far apart that the Indians eat each one separately as we might eat grapes.

The shepherds wander about looking at the different stands. Many things are shown which the children have never before seen. At one stand heaped high with yellow balls, they stop in amaze-



© Ewing Galloway, N. Y.

At the stand of the breadseller.

ment. The father knows what the balls are and he buys one for each child. He shows them how to take the peeling off. The children have their first taste of oranges.

The next day is to be the great day of the fair. Then the llamas will be judged and prizes will be given. Proud owners put on the final touches, fastening stays in the llamas' ears and tying blue

and white bows on the tips. A haughty llama with a black spot around one eye and its companion with the silly grin win first prize.

Mine managers come to the fair to buy llamas and to hire drivers with their animals to work at the mines. Several look at the prize winning llamas and offer good prices. The owner is too proud of them to sell. If he had not sold so much alpaca wool, he might have had to part with his prizes. But now he has money in his pocket. The manager



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The prize winning llamas at the fair.

then offers to hire him and ten of his llamas to carry supplies for the mine.

The Indian shepherd talks this offer over with his family and neighbors. They decide he had better go. His boys will herd the flocks while he is away. The little girls will help gather tola bush for fuel. When the pastures near home give out, the neighbors will take care of his flocks. His boys are too young to go alone on three-day grazing trips.

So it is decided that the shepherd is to hire out to the mine owner. He will go home before he goes to the mine, for it is not far out of his way and he needs some supplies to take with him.

The fair is over and the herders decide to start home. They pack on the llamas' backs bags of barley, two new foot-plows, a few boards, three pairs of new shoes for the men, some cloth, and four cotton shirts. With these treasures they start off up the mountain trail for the journey home.

GOING TO THE MINE

Before the father leaves his mountain home, the mother packs up a great pouch of chuno which she has ground fine between two stones. This food

must be carried because there are no hotels nor eating houses along the trail. It will take several days' travel over the steep mountain paths to reach the mine.

Since the man will sleep out under the clear sky, he takes two heavy llama wool blankets with him. The nights at this height in the mountains are certain to be very cold. The llamas usually can find pasture where they stop for the night. On this trip the driver wishes to hurry and the animals have little to carry, so he loads on their backs great bunches of barley hay for feed.

On the night before the father leaves, the family has a special treat for supper,—two guinea pigs. The guinea pig is about the only meat the Indian shepherds eat. Their animals are raised to carry burdens and to furnish wool, so it is very rarely that they kill one for food.

In the early morning the children go a half mile down the steep path with their father. A few minutes after he leaves them he is out of sight, for the valley makes a sharp turn and he disappears around the bend. He has to go down the valley quite a distance before he comes to the trail which leads up another mountain and on toward the mine.



Courtesy, Houghton Mifflin Co.

The pack animals of Colonel Hiram Bingham, the American explorer.

On the second morning after leaving his home, the Indian sees in the river valley far below him a dozen mules and three men. It is the train of the American explorer who took many of the pictures which you see in this chapter. The mules are going along a very narrow path. It is a wonder that some do not tumble off the path into the roaring water below. A narrow path with a steep

cliff on one side and a rushing river on the other is a dangerous place to travel. The sure-footed mule is one of the safest animals to use on such trails.

That night the Indian traveler reaches the mines



© Ewing Galloway, N. Y.

Ready to load copper at the mine.

and drives his llamas into a stone corral. In the morning he goes over to the office to find out where he is to lead his llamas. The manager tells him and he drives his animals to the loading place. Here is a great pile of bags all ready for the drivers to tie on to the backs of the llamas. Small cars bring the copper ore from the mine over very narrow tracks. This little track does not connect with the main railroad.

A railroad comes a long way from the coast to reach this plateau where there are rich deposits

of gold, silver, and copper. It climbs to the highest level of any railroad in the world. Building it cost a great amount of money. The owners never would have attempted it, had they not been sure of plenty of freight from the mines.

The mines are scattered and many are far up steep mountain slopes. Railroads can not be built to all of them. So drivers and llamas are hired to carry the minerals from the mines down to the railroad.

When the llamas are loaded they start in single file down the narrow path to the railroad station. Hour after hour they clamber down a trail so steep that we wonder how they can keep their feet under them. Often stones are loosened and go crashing down the mountain side. In some places steps have been cut in a steep cliff and the llamas really walk downstairs.

After a hard journey the llamas reach the railroad and the driver unloads the copper. A return load of supplies for the mines is taken on and the animals start back up the mountain trail.

The copper which the llamas just brought from the mine is loaded on cars, ready for the next freight train to pick up and take down the mountain.



© Ewing Galloway, N. Y.

Rounding the curve. Notice the people and their donkeys crossing on the swinging bridge.

Soon after the railway train leaves the station, it swings around a curve. There, rock had to be blasted out of the cliff in order to make room for the roadbed. Railroads in mountains usually follow the valleys to get the easiest grade possible. Even then many difficulties are met. The valley is usually narrow. The stream at its bottom cuts first against one side and then against the other. In some places it is necessary to bridge across. In other places it is better to blast part of a cliff away.

The railway train travels for hours through

these mountain valleys, winding this way and that. Sometimes the curve is so sharp that a passenger can look out of the window and see opposite him the engine which is pulling the train. Sometimes he may see two engines, for on steep grades a "double-header" is often necessary.

Again and again the train passes through tunnels, from daylight to darkness and back to daylight. Down it goes through lands where llamas, sheep, and alpacas are pasturing; then down through wheat and barley fields; then through fields of corn until finally it reaches levels so low and hot that rice, sugar cane, and cotton are growing.

All this winding and turning back and forth has been necessary in order to drop three miles from the high mountains to sea level. At last the sea-coast is reached.

There the copper from the Andes Mountains is loaded on the ships which are to sail to far-away lands. Some bring loads to the United States. You may have a penny made of this very copper. Perhaps the wire which brings electricity to your home is made of Peruvian copper, carried from the mines first by llamas, then by a mountain railway, and then by great ocean ships.

Work Out the Things Suggested on These Pages to See How Well You Have Understood What You Read about the Peruvian Indians.

1. Here are four letters written by boys who are visiting in foreign lands. Which of the boys is in the Peruvian Andes? Can you tell where the others are?

First letter:

"I am sitting on the porch of the rubber manager's office eating a banana. I just saw one of the workmen go by with a great bunch and begged him to give me two or three. They are no better than you are buying in the store at home but they are much cheaper. We can buy a whole bunch here for twenty-five cents."

Second letter:

"Yesterday we went up the river in a small boat. I watched the monkeys swing themselves from tree to tree on the vines. In the afternoon we had a terrible thunderstorm. I am getting used to them. It has rained every afternoon since I came."

Third letter:

“This morning Aunt Mary let me buy the water for the day. It does seem strange to buy drinking water by the gallon. I asked the donkey boy where he filled the jars and he told me all about the springs. Aunt Mary has promised to take me out to-morrow to see how the water is taken from the springs to the date gardens.”

Fourth letter:

“Yesterday I went with the shepherds up to the very highest pastures. I never had been so close to the snow caps before. I was very tired before evening came because the herds had to wander far to find feed. The grass was not so thick as it is in our pastures at home.”

2. Which of these fuels does the Peruvian Indian use to keep warm?

coal

gas

wood

tola bush

coke

3. The shepherds of Peru carry wool to market on the backs of———

camels
elephants
alpacas
llamas
horses

because these animals are sure-footed and can scramble down the steep, mountain paths.

4. Fill blanks with words below.

A family in —— is ready to sit down to dinner. Pedro shouts with joy. He sees a great treat, —— . The only other food on the table is —— . This is no treat because they eat it three times a day. It is made out of —— .

chuno
potatoes
roast guinea pig
Peru

Things To Do

1. Read *Donkey John of the Toy Valley* (by M. W. Morley published by McClurg). It is the story of a boy goat herder high up in the

mountains of another country. He goes down into the valley and learns to carve toys out of wood. Why do you suppose he was called "Donkey John"?

2. Look to see if you can find any pictures of men climbing mountains. Are the mountains snow capped? What kind of clothes do the men wear? Are they carrying long sticks with sharp points? Are they tied together with long ropes?

VI

PEOPLE WHO LIVE ON HIGH MOUNTAINS

ON EVERY continent there are mountains. In South America and Africa are mountain peaks near the equator that are high enough to be covered with snow all the year. In eastern Australia are mountains so low that trees grow to the very summits. In Europe are mountains where shepherds live. In North America are mountains where men mine gold, other mountains where they graze cattle and sheep, and still other mountains so high that they are capped all the year with snow and ice.

Railroad building in mountains is very difficult and costs a great deal of money, but in certain highlands there are passengers and freight enough to carry so that it pays to build them. In the highest mountains in the world is a railroad which climbs until it reaches a height of a mile and a half above sea level. This railroad was built to

carry people and tea. It is one of the strangest railroads in the world. So tiny is it that some Americans who have traveled on it call it the "Toy Railroad."

This "Toy Railroad" is on the other side of the world from us. You will know where it is when you find the highest mountains in the world. Start from New Orleans, the city where the thirtieth parallel crosses the Mississippi River. Follow this parallel half way around the world. You may go east or west, and one way is as long as the other. When you get half way around you will find the Himalaya (Hi-mä'-la-ya) Mountains, the highest in the world. On what continent are they?

The people who live in the Himalayas go to bed when we are getting up. The sun sets for them when it is rising for us. This is because they are just half way around the world from us.

UP THE HIMALAYAS ON THE "TOY RAILROAD"

Just at the foot of the giant Himalayas we board the train. We step in at the side of a little car. There is no aisle. The seats extend clear across the coach. Since the cars are only nine feet long there



On the "Toy Railroad" in the Himalaya Mountains. Notice that the train came through a tunnel under the track at the left of the picture in order to reach the loop on which it now is.

is room for only eight or ten people in each. The baby locomotive fusses a little, gives a jerk and off we go. The narrow track over which it draws the train is only two feet wide.

First we ride through a belt of dense forest. On every side are beautiful clusters of ferns, clumps of moss, and thickets of bamboo. The air is very hot, even though it is early morning. Soon we begin to climb. The engine puffs as if it were out of breath. It winds and turns from one ravine to another as it climbs the steep slope. At places it loops back and forth almost making a figure eight. Sometimes the engineer is near enough so he can speak to a passenger in the back car.

The engine is working so hard that it gets hotter and hotter. The passengers, however, are getting cooler and cooler. For we are leaving the hot, steamy summer of the plain behind us and in a few hours are up in the coolness of late spring.

Now the engine stops in a ravine to take on water. We step out of the car and climb up the hillside to pick sweet wild strawberries. We are up too high now for bamboo. Here we see oak and chestnut trees growing on the slopes.

Finally we reach the end of the road. Towering

off in the distance, and still far above us, we see the highest peak in the world, Mt. Everest. It is capped with snow, but so many clouds hover near it that we can not tell the snow from the clouds.

As we go about the streets of Darjeeling, the town at the end of the line, we understand the great relief from the heat which people who live on the plains can get in this half day's ride. Here it is pleasant and cool, and this is why hundreds of English and Americans come to Darjeeling to spend their vacations. Because of the cool air far above the heated plains the railroad makes money carrying hundreds of passengers.

On the way from the lower plains up to Darjeeling we pass scores of plantations where women are picking tea. This railroad carries the tea down to the foot of the mountains. Then the chests of tea are loaded on freight cars and taken to the seacoast. There, ships take on cargoes of tea and sail out through the Indian Ocean to Europe and North America.

THE SWISS ALPS

On the continent of Europe are the Alps Mountains. Find Europe on the map. About half way

between the equator and the north pole you will find the Alps.

High up on the slopes of the Alps, in the summer months, Swiss herders drive their flocks of cattle, goats, and sheep. Slowly, day by day, as the snow melts back, they push farther and farther up into the fresh, green pastures.

The highest pasture is reached in July, but they do not stay there long. On high mountains far from the equator summer is short. A few weeks after the spring snows have melted away, the fall snows come on. Then the herders with their flocks must work back down slope to their village homes in the valley. During the cold snowy winter the animals are kept in barns and fed.

These Alpine pastures which are covered with snow for ten months of the year, are not nearly so high as the Andean pastures where shepherds herd their flocks all year round. The reason for this difference in pasturage is that the Alps are much farther from the equator than are the Peruvian Andes. In the Alps peaks which are two miles high are snow-capped. In the Andes of Peru, no peaks are snow-capped unless they are more than three miles high.



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A summer pasture, high in the Alps Mountains. Notice the heavy rocks which hold the roof down.

When the Swiss herds are in the summer pastures close to the snow, there is no way to market the milk. To carry it down the steep mountain paths to the villages and towns is impossible. So the men who have charge of the cattle and goats make cheese. Cheese will keep, and can be taken down when the herders return to the village with the cattle.

Swiss cheese is so fine that people in the United

States are glad to buy it, even though it is more expensive than the cheese which is made in our country. When you find how far it has been shipped, you will see why it is high-priced.

With a string measure on your globe the shortest distance from Switzerland to New York. Record the number of inches. Measure the width of the United States from New York to San Francisco. How many inches is it? The distance across the United States is about three thousand miles. The number of inches you measured across the United States stands for three thousand miles. One inch on your globe, then, stands for how many miles on the earth? This number gives you the scale to use when figuring distances from your globe. Now look at your record of the number of inches from New York to Switzerland. How many miles does the Swiss cheese travel when shipped to our country?

To go across the United States on a fast train would take about five days. To go to Europe on a fast boat and then on a fast train to Switzerland would take at least a week. Freight does not travel on fast boats and fast trains. It probably would take more than two weeks for Swiss cheese to reach New York. Across what ocean does it come?

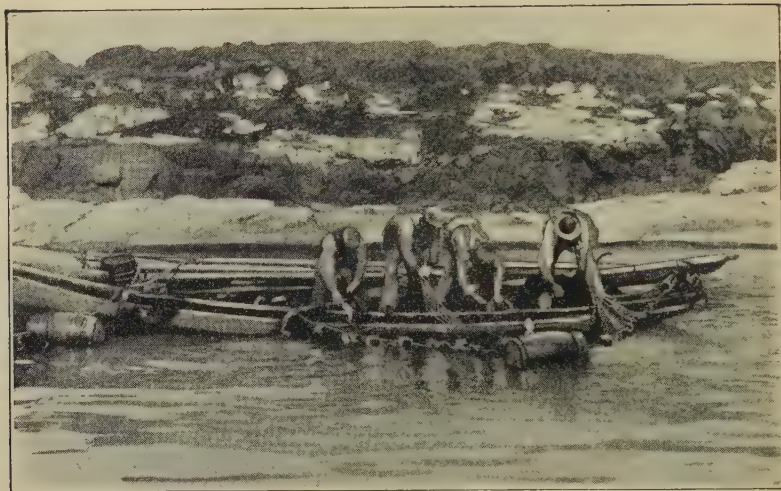
After the cheese reaches New York how far must it be shipped to your home?

Now that you know how to measure distance on the globe, see if you can answer these questions.

How far away from New York are the copper mines of Peru? What direction from New York is Peru?

How far do Brazil-nuts travel in coming to the United States? If you measure the shortest distance from New York to the Upper Amazon will you answer the question? How far down the Amazon River are they shipped? How far is it from the mouth of the Amazon to New York?

How far from their original home are the Jerid date palms which are growing in the United States?



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Newfoundland fishermen at the cod trap.

VII

FISHERMEN OF NEWFOUNDLAND

FAR north in the Atlantic Ocean is an island which is famous for its cod, its dogs, and its fogs. Even though we have never been there we may have tasted its cod and may have seen its dogs. But until we have actually felt its thick, wet, cold fogs, we can not really know Newfoundland (New-found-land').

If you will look along the Atlantic Coast of

North America, you will find the island of Newfoundland. On its eastern coast are the homes of fishermen.

FISHING NEAR SHORE

On a dull, cool June morning four men in a small fishing-boat were examining their cod trap. The trap is a large bag made of net. The fishermen had rowed two or three miles along the steep rock-bound coast of Newfoundland to reach their nets. When they had pulled the heavy net out of the water, they were disappointed at finding only a few fish in it. There were hardly enough to pay for the hard work of hauling it up. Back into the sea they lowered the trap, which is held in place by two water-tight barrels or buoys floating on the surface. The trap is so set that fish, as they swim along, will get caught in it.

Having had no luck at the trap, the men decided to spend the day fishing with hook and line farther out in the bay. They pulled away from the rocky shore, out to a good fishing place. Anchoring the boat at the place of their choice, they baited their hooks with small fish. Slowly they paid out the long lines. "Pay out" is the fishermen's term for

let down the line. Codfish feed on the sea floor, so bait which is to attract their attention must be let down to where they feed.

Hour after hour the Newfoundlanders patiently fished until the bottom of the boat was covered with big cod. When they rowed back again to the trap they found it full of glistening silvery fish. So many were there that there was not room in the boat for all the catch. So some of the cod were put in a bag net and dragged along behind the boat.

Just as the men finished resetting the trap a gust of wind dashed salt spray into their faces. They are used to this, for they are out on the water almost every day during the summer. Before many minutes had passed the wind had grown much stronger and the waves began to toss the boat about. The boatmen pulled harder on the oars, for their home was some distance away. When a bad storm comes up they can not land near the fishing grounds. The waves would dash a boat to pieces on the steep, rocky coast. Even in calm weather it is difficult to land in such a place. The fishermen are strong and used to all sorts of weather, but even strong men dread a storm off the coast of Newfoundland.

After an hour of heavy work the fishermen neared home. As they approached the shore they saw great red cliffs rising steeply out of the water. There did not seem to be any place where a boat could be brought to shore. But these men know every foot of the coast and they rowed straight ahead. Soon they slipped between two headlands into a little cove. Here the water was calmer and rowing was not difficult. The place they reached is Petty Harbor. The fishermen had returned home safe after a hard day's work.

Inlets which furnish protection from the storms of the sea are called harbors. The entrance to some of the harbors is so narrow that only small fishing-boats can come in. Others are wide enough and deep enough that large boats can enter. Harbors and coves are the only places where fishermen can land in safety. So only in these inlets do they build their homes.

Such places of safety are so important to the fishermen that many Newfoundland villages have "harbor" or "cove" as a part of their name. Along the south and east coasts we find villages with these names: Petty Harbor, Tickle Harbor, Shoe Cove, Boating Cove, Fortune Harbor, Lobster Harbor.



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Part of Petty Harbor, Newfoundland. On the hillside do you see the tiny gardens? In the foreground are platforms on which cod are drying.

On the steep cliff along the side of the cove where our fishermen landed are perched the little white houses of the village of Petty Harbor. At the wharf the men tie up their boat. The fish are carried up to the platform, where they are to be cleaned. From the hillside homes the women come down to help. They all work hard and before it is dark the fish are cleaned and salted. The day has been a long one, for at this time of the year the sun does



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Carrying up the day's catch.

not set until eight o'clock and twilight lasts until ten.

Bright and early next morning, about half past four, the men go down to the shelter where the fish were stored the night before. Filling baskets with fish they climb the steep ladders to the flakes (drying platforms). When they have carried up all the fish, they go to their boats and soon are out at sea again for another catch.

The women start work on the flakes, spreading



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Many days' catch, on the flakes.

the fish out to dry. These drying flakes are built high in order to be off the damp ground. They are made of saplings and floored with twigs. This makes an open work floor, which allows air from below to help to dry the fish. All along the cliff the flakes are to be seen. There must be enough of them to hold many days' catch, for it takes fish eight or ten days to dry in this damp cool sea air.

Every night the fish on the flakes must be piled up and covered with canvas. Rain may come at any time, and fogs are very frequent. The fish

must be turned over at least once a day in order to hasten the drying. Most of this work falls to the women. Bending over the flakes is back-breaking work and they are tired when the long day ends.

On the hillsides above Petty Harbor are the quaint little gardens of the fishermen. Such tiny patches ought not to need much labor. Yet they require much more work than we might think. For on the steep, rocky slope there is very little soil. The rain washes it off almost as fast as it is formed. If a man wants a garden he hunts the flattest place he can find. Even then, it is hardly more than a ledge. There he builds a low wall of the stones he has cleared from his garden patch. This wall will keep the soil from washing away. If he wants any crop at all he must do more than this. He takes a basket and walks along looking for tiny hollows in which a little soil has collected. This he scrapes up and carries to his garden spot.

Even with all this work the soil will be thin and poor. Something must be done to make it richer. The fisherman goes down to the coast where he has cleaned his fish and gathers up all the cod-heads which he has saved. These are spaded into the soil. This is much the way the Indians once did in New

England. We are told that they put a small fish in each hill of corn to enrich the soil.

The Newfoundland fisherman plants tiny rows of lettuce, cabbage, and potatoes. Hardy vegetables are all that he can grow. A poor soil is not his only hindrance. The summers are cool and damp, for the east coast is swept by winds from off the Atlantic.

A fisherman may own a cow. In the summer it must find its own feed on the hillsides. Because of the cool, moist, summer weather grass grows wherever there are patches of soil. To piece out this scanty supply, the cow marches herself down to the seashore. At high tide the water creeping in on the land brings great amounts of seaweed. At low tide when the water goes out a cover of seaweed is left on the rocks. The cow finds a good meal brought to her in this way.

The winter feed for the cow must be provided by the fisherman. In the summer he cuts grass in little hollows, a few handfuls here and there. Sometimes for his haymaking he rows out to small islands close to shore. There he cuts the little grass he can find and brings it back in his boat. The air is so damp and cool that it takes days and days for the hay to cure, spread out on the rocks.

It is said that when the winter supply of feed is low, the Newfoundland cow is sometimes fed codfish. One traveler says, "Everything and everybody in Newfoundland eats cod."

On such a bleak, barren ocean-border as this, man has to turn to the sea to make his living. Cod is his main food. It pays for his clothing, tools, and all the food he has to buy. The many inlets and harbors along this indented coast make it easy to go to sea. If there were no little bays and coves there probably would be no fishermen, for it would



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The heavy fishing boats tied to the pier.

be impossible to launch the boats or find a quiet place to unload the fish.

A TRIP TO THE GRAND BANKS

All summer long the little villages along the southeast coast of Newfoundland are sending out fishing schooners to the Grand Banks. The banks are shallow places in the ocean where the cod come to feed, and are fine fishing grounds.

Early on a clear morning we may see starting



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Fishing schooners on the way to the Grand Banks.

out from Petty Harbor the "Jolly Beggar" with ten men on board. In the hold of the vessel are several barrels of salt. Since the schooner will not come back to the village for many days, the fish must be cleaned and salted on board. The decks are crowded with casks and ropes and fishing tackle for the busy days ahead.

Out sails the little boat from the calm harbor into the rougher waters of the Atlantic. All day long their boat scuds before the wind, and as the sun sets they reach the Grand Banks.

Next morning, almost at break of day, the men on board the "Jolly Beggar" are up and preparing for work. As soon as breakfast is eaten, four dories (flat-bottomed rowboats) are lowered into the water. In each of these are three fishermen with tubs full of lines. Rowing from the schooner some distance, they reach the place where they are to set their lines.

After anchoring a buoy, they attach one end of the baited line to it. This long line, with many shorter lines hanging from it, is called a *trawl* line. One man rows the dory slowly along while one of his comrades pays out the trawl. When they have gone perhaps a quarter of a mile they reach the end

of the line and fasten it to another buoy. Think of a fishing line a quarter of a mile long!

For hours they work setting the trawl lines. Many dories from other schooners are also setting lines. Each crew knows its own trawls because the buoys fly little flags with the name of the owner.

The following morning at daybreak the crew of the "Jolly Beggar" sets out for the trawl lines. Rowing slowly along one of the lines, they pull it to the surface of the water and remove the cod. As each fish is taken off, the hook is freshly baited and dropped back into the sea.

With well-filled dories they row back to the schooner. When the cod are all lifted on board, more work must follow. The catch must be cleaned, salted, and packed in the hold of the ship. When the last fish has been dropped into the hold, the men are glad to tumble into their bunks to sleep. Handling wet cod all day is heavy work. Day after day the trawling and cleaning of the cod go on. As the hold fills up with fish, the men rejoice at the thought of plenty of food for the winter.

Sometimes, while the dories are out at the trawls, a heavy fog settles down on the Banks. Like a thick gray curtain this hides the schooner from

view. The sound of its bell is the only guide which the men in the dories have to lead them back. When the ship is anchored it keeps its bell ringing constantly to warn other ships.

Being lost in the fog is not the only danger which fishermen fear. The path of the trans-Atlantic steamships lies close to these fishing grounds. One of these big ships looming out of the fog would crush a dory to pieces in a second. In the early summer another danger threatens boats out on the Banks. Great icebergs float in the current from the north. In foggy weather when the lookout can not see them, the boat may be struck and sent to the bottom.

There are days when the waves run so high that the little dories dare not set out from the schooner. Some of the men, dressed in their heavy oilskin coats and rubber boots, with southwesters pulled well down on their heads, keep watch on deck. The others, glad of a day's rest from heavy work, mend the tackle.

After perhaps a week of hard work the hold of the boat is full of fish. The trawls are taken up and coiled on deck. The anchor is hove up, the sails set, and the "Jolly Beggar" sets out for home.

THE VILLAGE STORE

Each little village along the Newfoundland coast has its store. This carries all the supplies which the fishermen buy. It is here that they trade their fish for the things they need.

Only a part of the season's catch is brought to the store. Before the fisherman sells any, he must carefully stow away enough to feed his family and his dogs through the long cold winter. This supply can not be small, because codfish will be eaten three times a day. Fish pie, fish balls, boiled

fish, and even fish tongues make up the family's bill-of-fare.

The fish which the fisherman brings to the pier of the merchant are unloaded, weighed, and carried into the warehouse. The fisherman now goes to



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Unloading dried cod at the store.

the store to lay in the winter supplies which he is to receive in trade. On the store shelves are crowded a curious mixture of things to eat, to wear, and to use in boat building.

On the floor around the wall, barrels of molasses and flour stand beside barrels of kerosene and salt pork. Bales of woolen cloth and bundles of jerseys lie on the shelves beside balls of twine and piles of sailcloth. Boxes of fish hooks and children's shoes, tar and tea, oar locks and rubber boots all pass over the same counter.

Very carefully does the fisherman buy molasses, lard, salt pork, and flour. These with his cod must feed his family through the winter.

After he lays in the absolutely necessary supplies, he may hope to be able to buy nails, iron work, canvas, and rope to build a new boat. He probably has wanted this for several years, but has not had fish enough to pay for it. The good fishing season is only four to five months long. In that short time he is not able to catch enough cod to get much money ahead. So hard is the fisherman's life here that he is rarely able to pay for more than the things he must have.

Fortunately the Newfoundland fisherman does

not have to buy his wood. All he has to do is to go inland a little way to a strip of timber which the government has reserved for his use. There without cost he may get wood for his boats, for his house building, and for fuel. He uses the cold and stormy winter time for cutting the wood he needs. He has no horses to haul the logs home, so he takes his Newfoundland dogs to drag them over the snow.

Many other things besides wood-cutting keep the fisherman busy in the long, cold winter when he is not fishing. In the short days he repairs his boat or builds a new one. In the long evenings he and his wife tie new nets and mend old ones. Another job they must always attend to is patching the sails. If you examine the pictures carefully, you may find in one of them a well-patched sail.

For a long time only fisher folk lived in Newfoundland. In early days no one knew much about the interior of this large island. Later, men explored the island and found iron ore and valuable forests. Now a railroad has been built across the island. Lumbering and mining are being carried on. But fishing is still the most important industry of Newfoundland. Along the south and

east coasts the fisher folk of to-day live as simply as they have done for years and years.

Checks

1. Newfoundland is——.

an ocean

a continent

an island

a river

2. Copy this form and arrange the words below in the proper columns.

Plants which grow in
Newfoundland

Plants which do not grow in
Newfoundland

.....	
.....	
.....	
.....	
.....	

bananas cabbages grass rubber-trees potatoes
oranges Brazil-nuts manioc dates

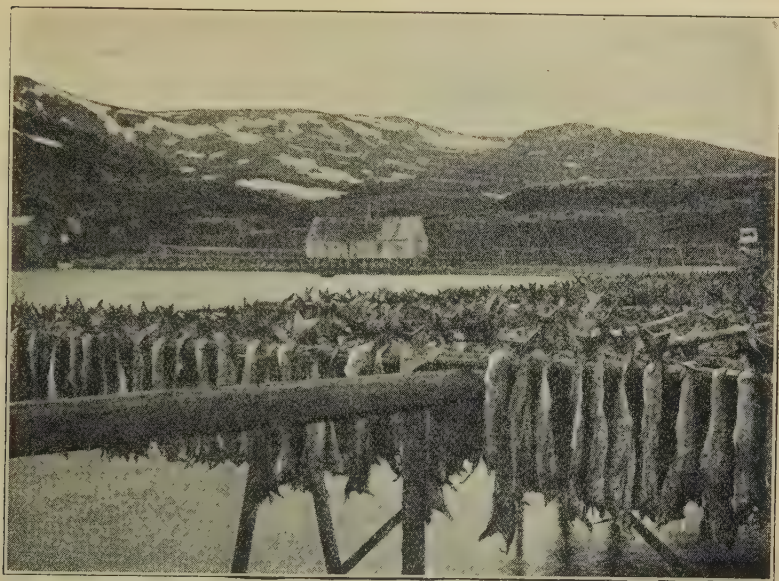
Can you tell why the plants you wrote in the second column do not grow in Newfoundland?

3. In southeastern Newfoundland crops do not grow well because the soil is———.
deep and rich
sandy and dry
thin and poor
4. In southeastern Newfoundland crops do not grow well because the———.
summers are long and warm
winters are short
the summers are cool
5. Fill in the blanks with the words below.
In southeastern —— men make their
—— by —— because the coast has many
safe —— and the sea contains many——.
living harbors fishing fish

Newfoundland

Things To Do

1. See if you can find several ways in which the people of the United States use cod.
2. Look in your grocery store to see if your grocer keeps any Newfoundland codfish.
3. If you can find the *National Geographic Magazine* for March, 1919, page 185, you will find a fine picture of two Newfoundland dogs standing on the rocks close to the seashore.



© Brown Bros.

Drying cod in Norway.

VIII

FISHERIES ALONG NORWAY'S COAST

“DOWN on the rocks by the sea, women are cleaning and salting cod, and laying them on the rocks to dry. Others are busy hanging the fish by the tail to wooden frames which stand near the coast.”

These two sentences remind us of Newfoundland, but they describe a scene in a fishing village



three thousand miles across the Atlantic from Newfoundland. The country is Norway. On what continent will you look for it?

This map shows a part of the coast of Norway. Notice the many inlets and islands. Of what value are they to the fishermen? Compare it with the map of the Newfoundland coast on

page 182. If there were not names on these maps, could you tell which was the Newfoundland coast and which was the Norwegian coast?

The coast of Norway is steep and rocky. Mountains rise directly out of the sea. In the picture is shown one of the fishing villages of Norway. Some of the houses are on the very edge of the water. To go from one part of the village to another, would it be easier to climb over the rocks or to go

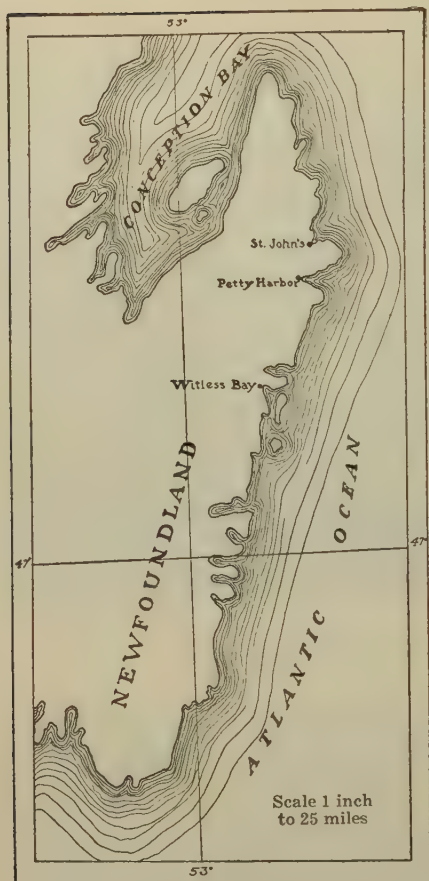


© Brown Bros

A Norwegian fishing village.

by boat? Do you see any place for a garden? The whole of Norway has very little farm land, so many Norwegians must turn to the sea to make a living.

Both Norway and Newfoundland sell fish to other countries. Across what ocean would ships loaded with dried cod for Spain sail from Norway? From Newfoundland? Which ship would need to cross the open ocean? Which could sail all the way close to land? For the salted cod Spain trades tons and



tons of salt. This salt the ships take back to the home lands where it is used to salt more cod.

Newfoundland sells much cod to the West Indies. Find these islands on the map following page 46. There the cod is a favorite food of the laborers on the sugar plantations. The West Indies trade molasses from their sugar plantations, for the cod.



Courtesy, Geological Survey of Canada

A happy reunion of Copper Eskimo hunters.

IX

THE COPPERMINE ESKIMOS

NOT many years ago a party of explorers visited the Eskimos in far northern Canada. A whole year was spent with one tribe which lives near the Coppermine River. When the explorers returned they told how the Copper Eskimos live. Many of the pictures you will find in the following pages were taken by these explorers.

THE RETURN OF THE CARIBOU HUNTERS

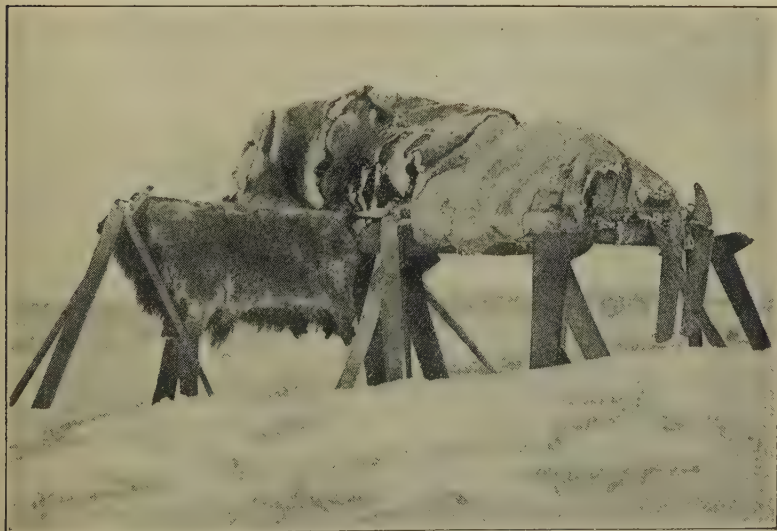
It is three o'clock on a November afternoon in the little Copper Eskimo village. Already it is dark and lights gleam through the ice windows in the row of snow houses. Suddenly the sound of dogs barking in the distance startles every one. Hurrying out from the village come a crowd of men, women, and children. Before they have gone far, a little, bright-eyed boy spies dog teams coming across the snow in the dusk. Yes! It is the last of the caribou hunters returning from the northern islands.

For several weeks these villagers, most of whom have been on hunting trips, have been gathering at their winter home on the coast of Coronation Gulf. All had arrived except the hunters from the north. They are late because ice has been slow in forming this fall. They had to wait for Coronation Gulf to freeze over, and for the ice to become thick enough so that traveling on it with dogs and sleds was safe.

Now that the missing families have come, all are happy. The women and children hug each other and laugh and chatter. Many questions are asked

of the hunters. Did they see many caribou? Caribou are wild animals that look very much like reindeer; some people call them American reindeer. Was the hunt successful? In answer, one of the hunters pulls back the sealskin cover from his sled and shows a great heap of dried caribou meat. On each sled is a load of this meat.

Laughing and talking, the Eskimos walk back to the village. Before they go indoors they must place their precious meat out of reach of the dogs.



Courtesy, Geological Survey of Canada

The loads of meat are safe from the dogs. See the caribou skin hanging from one of the sleds.

Several bring old sled runners and drive them upright into the snow. Then they lift the loaded sleds high on top. When the meat is safe they go indoors.

After supper every one wants to hear the stories the hunters have to tell. They crowd into the dance house. This is the largest house in the village, but it can hold only forty people. Some sit on the snow platforms, which are covered with caribou and musk-ox skins. There is not room for all the visitors on the platforms, so many have to stand. Although the floor is of snow, their feet do not get cold, for their boots are made of three or four layers of caribou skin.

The hunters tell how they reached Victoria Island. You can find Victoria Island on the map. There they found hundreds of caribou. Many were killed, and the hunters dried great quantities of meat. Every one in the village is pleased with the successful hunt. Now there will be more meat to add to the winter supply.

Besides meat, the hunters brought back many caribou skins for clothing. Some of these skins they wish to trade for other things they need. One man offers to trade a spear handle and another a snow shovel. The wood for these things



This map shows that part of Canada where the Copper Eskimos live.

had been brought back by the families who had traveled south to timber land. Some had carried back with them soapstone for lamps and copper for spear heads.

After the trading is finished, they proceed to enjoy themselves. Some dance, others prefer to visit. They have many things to tell, as they have

been separated since spring. So they talk until late in the evening.

BUILDING SNOW HOUSES

When the caribou hunters from the north reached the village on the November afternoon they found no houses awaiting them. They had wintered near this place for many years. But each fall they had to build new snow houses. Last year's houses were melted away by the summer sun.

When the first Eskimos returned in the fall the only trace they found of the old village was a group of stone caches. These piles of stone they had built in the spring. Inside of each cache was stored winter clothes and supplies.

To build the new village was their first work. Since they were going to build their new houses of snow, they must find a place where the snow was suitable for their use. It must be deep enough and hard enough for great blocks to be cut from it. On wide level stretches there was only a thin snow cover. In the shelter of a cliff they found a place where snow had drifted two feet deep.

For the long cold winter, Eskimos need thick-

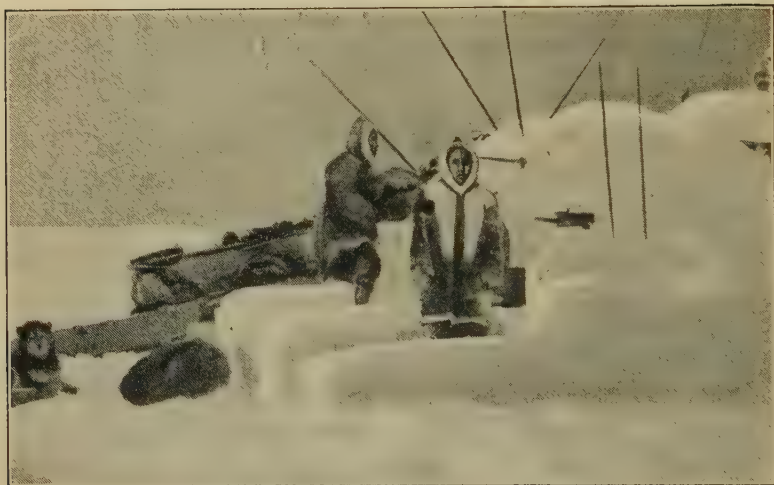
walled houses. They can not build houses like ours. In that cold land no trees grow which can be used for lumber. They have no tools to quarry out building stone and no way of firing brick. They can not buy these things as we do, because no railroads reach their lands.

Sometimes in summer a fur-trading boat comes to their shores, but it has no room to carry lumber for sale. Even if these things could be brought to this land, the Copper Eskimos would have no money to pay for them.

So the Eskimos must choose between sod and snow for building material. Some Eskimos do choose to build with sod. The Copper Eskimos prefer snow. Snow makes a good building material in a land where there are no warm days in the winter. At Coronation Gulf every winter day is very cold. It is below zero all winter long.

The morning after the party in the dance house the villagers, like good neighbors, turn out to help the hunters build their new *iglus*. *Iglu* is the Eskimo word for house.

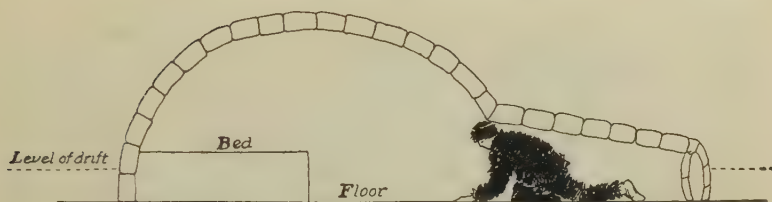
Although it is nine o'clock, the sun has not yet risen. They can see to work, for it is dawn and the ground is white with snow. The snow for the



Courtesy, Geological Survey of Canada

The snow house is completed except for roofing the passageway.
How high do you judge the house to be? Can a man stand upright in it?

house is cut with copper knives. The domino shaped blocks are set on edge in a circle. One block is laid on top of another. Each leans in a little, so that the top of the house is dome shaped. Soon the blocks freeze together. Wherever the children can reach, they help fill the cracks with snow. Inside of each new house a woman works, leveling the floor in the front half with her snow shovel. She piles up the snow in the other half for a sleeping platform.



Cross section of the iglu.

After a house is built, a trench leading to the door is dug in the drift. With snow blocks they roof the trench over. A passage such as this is better than a door in the side of the house, for it does not let in as much cold air. The passage, or tunnel, is so low that people have to crawl through it on hands and knees.

Each house has only one room about nine feet across. This may seem small, but large houses are not fashionable among Copper Eskimos. There is a good reason why they are not. The winter is long and very cold and it would be hard to keep a big house warm. If they had plenty of coal and wood they might be able to heat a large house. The best fuel the Copper Eskimos have is seal oil, and it takes much work to obtain that.

By noon all the new houses are built. Into each house a family moves. Their moving day is nothing like ours. It is too hard work to crawl through

the long tunnel and carry furniture. So they cut a hole in the wall and pass in their belongings. They shove in some skins for bedding. Then they hand in a board for the table top, a lamp, some kettles, the mother's sewing bag, and the children's toys. Their moving is done.

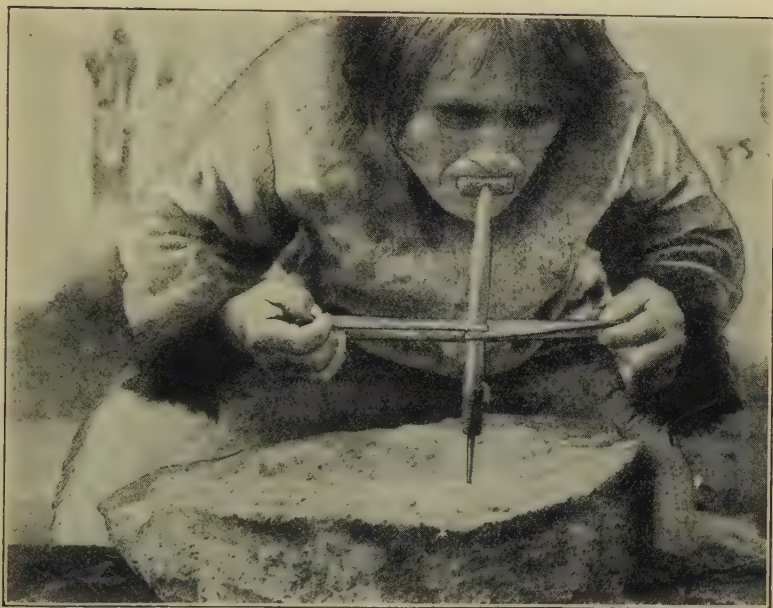
When everything is inside, they fit their precious window into the hole and pack snow tightly around it. The window is a piece of clear ice they had brought from a lake near by.

There is not room in the new house for winter supplies. Meat and fish will not keep in the warm room. They can not leave these out-of-doors for the dogs will steal them. Each Eskimo family builds a little snow storehouse off the tunnel. In it they put their food, oil for the lamps, skins for new clothes, and food for the dogs. Their holiday clothes they pack in sealskin bags and throw them up on top of the snow house.

HEATING THE HOUSE AND COOKING

THE EVENING MEAL

The work outside is done for the day. It is time to heat the house and prepare supper. Let us visit one home. The mother sets out a soapstone lamp.



© Publishers Photo Service

The rough piece of soapstone which is to be hollowed out
for a lamp.

If you wish to see how a lamp is made out of a block of soapstone, look at the man in the picture beginning to hollow out a new one. The lamp serves as a stove also. The mother rolls a wick of dried moss and places it in the lamp. Over the side she hangs a piece of blubber. Blubber is the fat of sea animals. This blubber is from the seal.

One of the boys makes a torch of dried moss and

goes to the neighbor's. He lights his torch at the neighbor's lamp and runs home to start the new fire. In the lamplight the room is beautiful. The snow crystals of the ceiling and walls sparkle and glisten.

Soon the house becomes comfortably warm. The Eskimos take off their hoods and their outer garments. The snow wall thaws very little. It is so cold outside that the wall freezes almost as soon as it thaws.

The mother hangs the copper kettle with its handle of braided sinew over the lamp. In the kettle is snow. This is the way Eskimos obtain water in winter. What a slow way to get water for a drink! Think how long it would take and what a great amount of blubber would be used if they tried to get enough water for a bath. We understand now why Eskimos seldom take baths in the winter.

While the snow melts, the father cuts caribou meat into small pieces with his copper knife. As soon as there is water in the kettle the mother drops in the pieces of meat. No salt is added. As they have never tasted salt they do not miss it.

After the meat has been brought to a boil, the



© Publishers Photo Service

Preparing supper inside the snow house.

mother takes the kettle from the fire. She lifts out the meat and puts it on a wooden platter. Then the broth is poured into cups made of the horns of musk oxen. This is their supper: caribou fat, frozen caribou meat, dried fish, caribou broth, pieces of caribou leg. No vegetables, no milk, no dessert!

FISHING THROUGH THE ICE

One morning the villagers look at the food in the storehouses and find that the caribou meat will not last much longer. They must secure more food before the dark weeks come. The days are growing shorter and shorter. The sun rises later each day. Now, in late November, it is almost half past eleven in the forenoon when the sun shows above the southern horizon. It has no sooner risen than it begins to set, for by half past twelve it has disappeared.

Yet the day in the Northland is not so short as you might think. Twilight and dawn are longer than they are with us. At this time of year there are about six hours of the day when it is light enough to fish, though not light enough to hunt successfully.

The men decide to go fishing, and bring out their fishing tackle. Hooks and lines are used, but no poles. They take copper ice picks, like chisels, with them to cut holes through the ice. The fishermen travel far out from shore. Near shore solid ice reaches to the bottom. Farther out there is deep water under the ice and there the fish are.

When they reach a place where they think the fishing may be good, they at once begin cutting holes through the ice. They find it is two feet thick. Their fishing lines are made of braided



Courtesy, Geological Survey of Canada

A Copper Eskimo jigging through the ice.

sinew of the caribou. On the copper hooks hang little pieces of bones. The lines are dropped down through the holes and moved up and down to make the little bangles of bone dance to attract the fish.

A fish bites at the hook and it is drawn up quickly through the hole. When the line is dropped down the fisherman says, "Taki, taki, taki." This means, "Come, come, come." In the picture you see a fisherman who is having good luck. He has caught three fish already.

After the men have fished for several hours, they load their catch on the sleds. The dog teams hurry back to the village without being urged. The dogs know they will have a good supper. The Eskimos will enjoy fresh fish for supper also.

For several days the Eskimos keep on fishing. Their luck continues good and a large catch is stored in the supply houses.

SEALING THROUGH THE ICE

When December comes the supply of caribou meat in the village has all been eaten. The Eskimos are rather tired of fish. They would like meat to eat and they need more blubber to burn in the



Courtesy, Geological Survey of Canada

Copper Eskimos moving out on the ice.

lamps. So they decide to move out on the ice at once. There they will be nearer the sealing grounds.

On moving day every one is up early. The men get the sleds ready while the women bring out the household goods. The packing is quickly done. They take all their belongings, even their ice windows. Some of the sleds are piled so high that we wonder how dogs can pull them. After a few hours' travel over the ice, they reach the sealing grounds. By night new snow houses are built out on the ice.

Next morning the men get ready to go sealing. Each man puts a light harness on his dog. He takes no sled, as he needs his dog to help him find the seal holes. His harpoon and the rest of his



Courtesy, Geological Survey of Canada

Harnessing the dogs for a sealing trip.

equipment is slung over his shoulder. Off they go over the ice.

The seals spend the winter in the deep water under the ice. There they can find fish for food. Seals must come to the surface now and then for air. How can they do this when the ice is several feet thick as it is all over Coronation Gulf?

When the ice first began to form the seal could easily break through to reach air. As the ice became thicker and thicker, he kept several holes

gnawed through to the surface. If he suspects an enemy at one hole, he uses one of the others. At the surface of the ice the hole is only an inch across. Below, it is large enough for him to wiggle into and push his nose up to the air.

When the sealers have traveled about a mile one dog puts his nose down to the snow and sniffs. The men can see nothing, because snow covers the ice. They know that the dog has found a seal hole. A man clears away the snow, and sure enough there is a small hole up through the ice.

In the hole the hunter sticks a little ivory rod and packs snow about it to hold it in place. He may have to stand hours and hours waiting for the seal to come to this hole. To protect his feet from the cold, he lays down a caribou skin mat and stands on it.

At last the ivory rod is pushed up. The Eskimo knows what has touched it, so he hurls down his harpoon and catches the seal. Immediately his companion who is watching a hole near by comes to help him. One holds on to the harpoon rope. The other chops the ice away to make the hole large enough for them to pull out the seal. If you have seen seals at the circus you know how big this hole

will have to be. When they have the seal out on the ice they call a dog. Their catch is fastened to the dog's harness and he drags it over the ice to his master's house.

When the hunters return the children are out-of-doors romping with some puppies in the snow. They see the dog bringing the seal home and off they rush to meet him. In play they fall on the seal and pretend to stab it as the hunter did with his harpoon.

At the entrance to the house is the mother. She drags the seal indoors. At her heels are the children. One little girl helps her skin the seal while the others watch eagerly. They beg for tiny pieces of blubber. To them it is as good as candy. Two little boys are sent to carry pieces of seal meat to the neighbors.

GOING VISITING

Through most of December and January the Copper Eskimos never see the sun. Perhaps you imagine this is very unpleasant. But do not think of a night so dark that you have to feel your way around. Some of the time the sky is clear and the stars are shining brightly. Often in northern lands

beautifully colored bands of light glow in the sky. These are called northern lights. Even though the sun never rises, their southern sky at noon is as bright as our western sky just after the sun sets.

In these months it is too dark to hunt caribou and musk oxen. Nor is it light enough to trap or to fish easily. If they have plenty of food stored away, Eskimos do not dread the weeks when the sun does not shine. There is plenty of light for them to have a good time. Often in their vacation they go visiting.

Two Eskimo families are going to visit some friends in a neighboring village. How do they travel? They have no roads, no wagons, no horses. Even though it is very cold, it is a good time of year for a trip. For now they can go with dog sleds over the snow and ice. In the summer they might go by boat, but at that time they are too busy hunting to take a vacation. In summer, it would be difficult to find their friends, as they, too, are away hunting.

It is a long journey to the place where their friends live. They are thinking of this when they prepare to go. Our Eskimo families who plan to make the visit are on the ice not far from the

mouth of Tree River. (Map, page 187.) Their friends winter near the western shore of Bathurst Inlet. (Map, page 187.) Bathurst Inlet and Coronation Gulf are covered with ice.

Over the ice is snow several inches deep. Here and there are great stretches of ice where the wind has swept the snow away. It is easy to travel on bare ice with the sleds. The journey will take about four days as dog teams travel ten or twelve miles a day at this time of year.

For the trip they must take, therefore, four days' supplies for the families and the dogs. Suppose a sled should break down after they have gone twenty miles. Or worse than that, suppose the travelers should get caught in a terrible blizzard. Bad storms are common during this dark time of year.

To be on the safe side, they pack a week's supply of frozen seal meat and dried fish on the sleds. They also load soapstone lamps, skins for bedding, and leather bags of seal oil.

When the sleds are packed, the people all dress in their best clothes. One little girl runs out at the last minute with her doll, which is made of skin stuffed with hair. She is taking her new doll to show the friends she is going to visit.

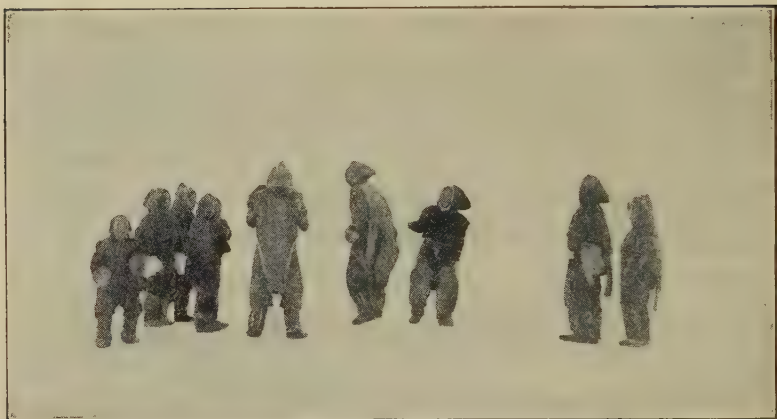
Off they start! The grown-ups walk. They can travel as fast as the dog teams can pull the loaded sleds. The little tots ride a while, then climb out and walk a bit. Soon they are glad to snuggle back in the heaps of skins on the sleds. No one gets cold for all are dressed in warm furs. Even their underwear is soft caribou with the fur side next their skins.

Where will the travelers sleep? When they and the dogs begin to get tired, they stop on a big snowdrift. There the men build a snow house in about an hour. After they eat supper the dogs are fed. Then all rest snugly in the little hut.

They have no misfortune, and the trip is made in four days. Their friends are delighted to see them. Exciting shooting matches with bows and arrows take place every day. Jolly parties and dances are held at night.

In the picture on the next page the children are playing "wolf." You see the boys and girls dress alike. One child is the hunter. Leaping and howling like wolves, the others run away from him. The hunter chases after them and the first one caught becomes the hunter.

After several days the visit is over and it is



Courtesy, Geological Survey of Canada

Copper Eskimo children playing "wolf."

time to start for home. It has been so pleasant that they are sorry to leave. Their friends pack the sleds with food for the return trip and bid them all good-by.

On the fourth morning of their homeward journey the skies look very stormy. They hurry, hoping to get home before the storm breaks. But by noon the blizzard is raging. They struggle on. The snow beats in their eyes. They pull their fur hoods close about their faces. The poor dogs have no such protection. Their eyes fill with snow. They can not see to go on. Clearing the snow from the dogs' eyes, the men urge them on again.

The travelers dare not stop for they would freeze to death. The wind howls. It is hard to stand upright. How long can they keep going? Suddenly they stumble against one of the snow huts they had built on their outward trip. All are glad, and the people and dogs crowd inside.

All that night and the next day the blizzard rages. They are glad now that they have extra food. On the second morning the sky is clear, the stars shine brightly and they travel safely home.

TRAPPING

During February and March the Copper Eskimos are busy trapping wolf, ermine, and white fox. These animals have beautiful fur which people in southern Canada, the United States, and Europe are eager to buy. Eskimos need furs for their clothing, but they do not wear white fox, ermine, and wolf. These they sell. They do not sell caribou skins, but use them for their own clothes. Sometimes an Eskimo may wear a small piece of beautiful ermine because he believes it will bring him good luck.

The Eskimos trap in winter because then animal

coats are heavier and more glossy than in summer. Animals need thicker fur to keep them warm in cold weather. Another reason why Eskimos trap in the winter is because then the Arctic fox is pure white. In summer it is bluish gray and does not bring so high a price.

Years ago, buyers who were eager to get large supplies of furs, came into the Northland. The natives had few furs to sell. They had no good way of catching small animals. Therefore, the traders provided the Eskimos with steel traps.

When an Eskimo goes out to trap he digs out a bit of snow. He places his open steel trap in the hole and scatters snow to hide it. Then he shaves a few chips from a piece of frozen blubber and throws them around the trap. These are to attract the animals.

Next day he hurries back to see what he has caught. He may visit a dozen traps and find them empty. If he finds a fox in one he is lucky. He goes home with his fox and throws it down upon the floor of the warm hut to thaw. Several hours later he skins the animal. His family then has a feast on the meat. Copper Eskimos say that white fox meat is very good.



© Publishers Photo Service

The trading post. The snow houses look rather hastily built.

A VISIT TO THE TRADING POST

By April the trapping season is over. The great pile of skins is counted. One fortunate Eskimo has a hundred white fox skins. Altogether the trappers have several hundred fox skins and a few wolf and ermine skins. Now they pack up the pelts and take them to the trading post. The sledding is easy and travel is pleasant. The sun is up for a long time each day and the middle of the day is not very cold. At night it is still below zero.

The trading post is at the mouth of the Tree River. The trappers build two snow houses near the post because they will stay several days there. Their food supplies are put on top of the snow houses to keep them out of reach of the dogs. Do you notice in the picture that the trading post is built of wood? The Hudson Bay Company, which owns this post, sent the lumber on a ship which carried supplies for the traders. Evidently the trader did not find his house warm enough, for he banked it up with snow. This method of making his house warmer he learned from the Eskimos.

The picture opposite shows the trappers inside the trading post. The wall is covered with fox skins. The fur upon which the people are sitting is caribou. When the trader came from southern Canada to this Northland, he found that he could keep warm more easily in Eskimo clothes than in his own. He is wearing a hat which he brought from the south.

The trader has an Eskimo helper. He is wearing some things that the white man has given him. The trapper shows the trader his beautiful white fox skins and bargains closely for a rifle, some cartridges, a small canvas tent, and an iron kettle.



Inside the trading post.

When all the bargaining is done, the trappers pack up their new belongings and start home. The homeward trip is much easier for the dogs because their loads are light.

A BUSY VILLAGE

When the trappers reached home they found the village a busy place. The women were doing their spring sewing. Their well-worn furs were being mended carefully. They knew that these would be comfortable for summer weather. They were making new water-proof boots of sealskin. The seams were sewed tightly so that no water could get in. When the warmer days make the snow mushy, all the family will be glad their water-proof boots are ready. Many families needed new tents. As many as fifteen caribou skins were sewed together to make a large tent.

Some of the men were busy making small boats. Wood is used for the framework. Over this frame, sealskins are stretched tightly. Even the top of the boat is covered, except for the opening in which the paddler sits. These kyaks (Eskimo word for small boats) will be used for summer caribou hunt-

ing. It seems strange to use a boat for hunting land animals. When we read further on about the summer hunt, we shall see how they use kayaks.

Before all this work was finished, living in snow huts became a bit unpleasant. The middle of each day was warm enough to melt the roofs of the snow houses a little. The nights were still so cold that there was no melting then. About noon each day the drip, drip, drip from the roof made it difficult to keep the bed furs dry. Some of the house owners then took off the snow roofs. They roofed the houses with caribou skins. Later the melting kept up so long each day that the houses became too wet for comfort. Then they moved into their spring tents.

SPRING SEALING

Spring is the time for the great seal hunt in Eskimo lands. At that time sealing is not so difficult as it was in the middle of the winter. The snow on the ice is melting. It is much easier to find seal holes now that great stretches are bare of snow. Leads are opening in the sealing grounds. A lead is a channel of water between two fields of

ice. Through them the seals climb up on the ice to sun themselves.

Bright and early one morning the men start out to shoot seals. Off in the distance, one Eskimo spies a little black speck. It may be a seal sunning himself. The Eskimos go across the ice, jump a narrow lead, and reach the field of ice where they see the black speck. It moves and the Eskimos are certain it is a seal.

Nearer and nearer they creep very carefully. The seal raises his head. He is always on the lookout, for he fears his enemy, the polar bear. The seal spies the Eskimos and quick as a flash he flips into the water. For an hour they wait beside the lead where they saw him disappear. They are just about ready to give up and move on, when suddenly a seal's head pops up. One hunter fires his rifle and hits the mark. The seal's body soon comes to the surface and floats. The other Eskimo throws a harpoon into the body and they pull it out on the ice.

Back to the camp they go with the seal. There they skin it carefully so that a bag can be made of the skin. The women cut the blubber into bits and store it in a sealskin bag while the men go off for



Courtesy, Geological Survey of Canada

Summer tents. Here caribou skins are dried.

more seal. They hope to get enough blubber to fill this bag and many others. Each family wishes to store away five or six bags for the next winter.

Every few days all the Eskimo families that are out on the ice move in a little nearer to the land. As the days grow longer and longer, more leads open. In early May they move off the ice back to their old home on the coast. Here they pitch the tents close to the sea coast on a patch bare of snow. The sea is still frozen and snow still lingers in many places.

GOING SOUTH FOR THE SUMMER

It is June in the Northland. Spring is passing and for weeks the sun never sets. Day after day it circles around the heavens. At midnight it is just above the northern horizon. At noon it is quite high in the southern sky. It would seem that sunshine all day long ought to make a place warm, but much of this heat is used up in melting the winter's snow and ice. Soon the snow will disappear. With July will come the summer. Then there will be no snow except on the mountains. Some ice will still remain in the Gulf. Soon the grass will be green and the flowers budding.

Already some of the hunters have gone to the large island north of the Gulf to hunt caribou and to fish in the lakes. They had to start earlier than those going in other directions, for they had to cross Coronation Gulf while traveling on ice was still safe. By June the ice usually has broken up in the Gulf.

The rest of the villagers are preparing to go southward for their summer fishing and hunting. They plan to go to the region between the Coppermine River and Great Bear Lake. This is one of

the fine caribou hunting grounds of the Northland. Some of the Eskimos plan to go into the timber land around Great Bear Lake to get supplies of wood. Some will go to the Coppermine River where they usually find a little copper in the gravel near the water. This copper is so pure that it can easily be pounded into knives, spear heads, and fish hooks.

Before leaving their homes all the things they do not need for summer must be stored away in the stone caches: winter clothing, harpoons, ice chisels, winter bedding, and bags of seal oil. They store the lamps too, for in the summer they build fires out-of-doors and burn heather and dwarf birch which they pick up as they travel along.

Preparations for the trip are soon made. Only a few days' supply of meat is packed because food will be found as they travel. Caribou are likely to be found along the way, and they will have caribou steak. In the lakes and small streams fish are plentiful.

The travelers must take with them tent poles, skin or canvas tents, spears, bows and arrows, and rifles. Some carry with them their small lightweight boats.



Courtesy, Geological Survey of Canada

Traveling southward, well laden.

Sleds can not be used now, for the ground is bare. The dogs still help in traveling but in a very different way. Each dog has two leather pouches slung over his back. In these pouches smaller articles are packed. The men and women carry the bulky things. The precious kettle is usually carried by the cook.

The first stop is made near the mouth of a small creek where salmon are swimming up the stream. Fishing here will be much easier than winter fishing through the ice. Little stone fences or dams are built to stop the fish. Long spears are used by the fishermen. Fish are so plentiful that some-



Courtesy, Geological Survey of Canada

Copper Eskimos spearing fish.

times the men spear two, three, or four at a time. The women split the fish and hang them up on racks to dry in the sun. Any day we might see a great rack full of fish near the tents.

While one group is fishing, some of the others carry the kyaks to a lake near by. With them go the dogs. For the past few days the Eskimos have been seeing caribou going off in that direction. Some of the company go back for half a mile or so to see if any caribou are near. Three of the men go to the lake, push out in their kyaks and wait quietly. A herd of caribou comes up slowly, feeding on the way.

The men and women circle around behind the caribou and howl like wolves. The frightened animals run toward the lake with the dogs in close pursuit. To the very shore of the lake the caribou are driven. Some rush into the water and try to swim across the lake. The men in the kyaks paddle out among the caribou and spear several. Loops of rope are thrown over their horns and they are dragged to shore. The hunters all go to work to skin the animals and dry the meat.

For several days the fishing goes on. When all of the catch is dried they are ready to break camp.



Courtesy, Canadian Geological Survey

Copper Eskimos drying fish.



© Publishers Photo Service

Father and son. The Eskimo has taken his child in his kyak, to teach him how to fish.

A stone cache is built and the fish stored away. They plan to come back to this cache in the fall and take the fish home with them. Their tents are packed and they start off. At the lake they stop to ask if their friends are ready. The caribou hunters have been so successful that they decide to stay near the lake for a while to hunt.

The journey made by the Eskimos is unpleasant in many ways. Walking with a load on one's back is hard work. Heavy fur clothes are very uncomfortable when the thermometer is at eighty degrees. On a few afternoons in July and August it gets as warm as this.

No darkness comes to tell them when to stop traveling or hunting and make camp so they can go to sleep. One time for sleeping is as good as another. Even by the end of July the sun is below the horizon for only a few hours each night and it is never quite dark. Sometimes while on a trip they will not sleep for two whole days. At other times they will sleep a few hours after they have eaten supper, and then get up and go on again.

The hunters are traveling over a low plain. In some places it is covered with grass, in other places with gray-green reindeer moss which grows several inches high. Here and there are beautiful flowers. Some of these, such as the buttercup, fireweed, poppy, and bluebell, we know. Among the flowers buzz bumblebees and blue-bottle flies.

Great marshes are along the way, and the hunters wind about trying to avoid them. But they can not avoid the inhabitants of these wet lands. Every-

where the z-z-z-z-z of mosquitoes is heard. Even though it is warm, the poor Eskimo must keep his neck and arms covered, for the mosquitoes torment him dreadfully. They attack the dogs also. Some of the dogs are almost blinded because of their eyes swelling shut from the bites.

To reach the good hunting grounds takes several weeks. There is no need to hurry, as August is the best time to hunt and obtain supplies for winter. By August the caribou have had good grazing for two months and are then fat and the skins are in fine condition.



Courtesy, Dr. F. N. Mead

A caribou. Notice the pasturage on which it was feeding.

One August day the Eskimos see in the distance a larger herd of caribou than usual. Packs are quickly dropped. The men rush off with their rifles. The women busy themselves making camp. After a time the tents are all up, but the men have not returned. The women and dogs start off in the direction the men have taken. Soon they find a caribou which has been shot. A few minutes later they find the men skinning other caribou. The women help pack the meat on the backs of the dogs. Back to camp they all go.

At the camp the meat is cut into thin strips and spread out on stones to dry. After several days the dry meat is cached. The caribou hides are too precious to cache so they carry them along.

One day in their wanderings they find a large patch of crowberries. These are as black as the bird for which they are named. Since the Eskimos live on meat and fish all the year, berries are a great treat. In this Northland the summer is so short that no crops can be raised. Only a few wild plants bear fruit which is good to eat.

Each day as they travel, new sights are seen. They know when they are nearing the timberland because occasionally they come upon clumps of

bushes. A little farther south they see dwarf birch trees. We would hardly call them trees for they are only two or three feet tall.

Soon the Eskimos reach the timberland and camp for the first time this season among the trees. There they find many birds which we saw flying north over the United States in the spring.

More caribou are killed here. This time after the meat is dried they cache it in a tree. Here in this timberland they can make things out of wood which they need. The trees are small, but they are large enough to use in making harpoons, spears, and new sleds for next winter.

By the middle of September they have dried much meat and stretched many skins. They have also made many wooden articles. How will they carry these heavy loads back to their winter home? This does not trouble them for they plan to stay until there is enough snow for sledding. Then they will use their new sleds for the return trip.

It happens that the snow is late this year. The caribou have left these feeding grounds. Before snow comes the Eskimos have to begin eating some of the dried meat which they expected to save for winter.

At last there is enough snow for the start. They load their supplies on the new sleds. It is hard sledding, for the snow cover is not deep and in many places there are stretches of bare ground. The sleds often stick and the men have to lift and shove. The dogs alone are not able to haul the great loads so the men and women must help.

On the way back they will visit their caches to get the meat which they had packed away. The first cache they come to is safe, and the meat is loaded on the sleds. The next cache they find has been robbed. They are sure it must have been wolverines. All the meat is gone. They are very sad because they fear the long winter ahead.

As they travel along toward the next cache they talk of the hard times three winters ago. One tells how they had to kill their dogs for food. Another remembers that they ate even the caribou sinew they had stored for thread for the spring sewing. As they travel on they worry more and more. What if the next cache has been robbed too?

Fortunately they find all the other caches safe. Gladly they gather up full loads of dried fish and meat. After several weeks of travel they arrive at their wintering place on Coronation Gulf and

again build their snow houses as they did the winter before.

THE FUTURE FOR THE ESKIMO

Since white men have brought traps and rifles into the Northland, more and more animals have been killed each year. This means that food will soon be harder and harder to find. Perhaps herds of reindeer will be brought into the region and the Eskimo will become a herder. Then he will have a surer way of making his living.

HOW THE COPPER ESKIMOS USE WHAT NATURE HAS PROVIDED

We now know that the Copper Eskimos live as they do because of their surroundings.

1. Their home is in a region a thousand miles from the nearest railroad. Even in summer it is almost impossible for ships to reach their shores, because of the great amount of floating ice in the Arctic Ocean. Therefore, their food, clothing, and shelter can not be brought to them from the outside world. They must use what they can find in the region where they live.

2. Their warm season is little more than a month long. This is too short a season for crops to ripen. Therefore, the Eskimos can not farm. They can raise no grain, no vegetables. But animals are abundant on land and in the sea. Therefore, the Copper Eskimos make their living by hunting and fishing. Almost all their food is meat and fish. Their clothes are made of the skins of animals. The seal furnishes oil for them to burn.

3. The winters are long and steadily cold. Therefore, thick-walled houses and fuel to warm them are necessary. They use snow for their winter houses. In the short summer, snow houses melt away. Then the Eskimos move into skin tents.

4. Because of the ice and snow in winter, sleds and dogs can be used for travel. In summer the snow is gone. Loads must be packed upon the backs of people and dogs.

5. The beautiful furs of some of the animals of the Northland are the only things the Eskimos have to sell. Some of these furs are rare and hard to obtain and have to be sent so far to the people who want them, that they are very costly.

COPPER ESKIMO NAMES

Men	Women
Ag-lu-ak	Nik
Kun-i-lik	Nil-gak
U-lok-sak	Tu-pik

Checks

1. All of the boys who wrote the sentences below, live north of the equator. Which boy lives nearest the Copper Eskimos? Which one lives nearest the equator?

- A. On Christmas day I am going to wear my new white linen suit and go to my aunt's for a picnic dinner.
- B. On Christmas afternoon I hope we can have a sleigh ride. There will be plenty of snow. There always is but it will be no fun to go sleigh riding unless the moon is full.
- C. On Christmas afternoon after we have eaten our roast turkey we shall play games. Perhaps we shall go coasting if the sun does not melt all the snow off before then.

2. At midnight in June the Copper Eskimos see the sun on the northern horizon. They have seen the sun every hour of the twenty-four. That makes a long day. How long do you see the sun in June? Where do you see it rise? Where do you see it set? In December the Copper Eskimos never see the sun. How long do you see the sun on a bright December day? Where do you see it rise?

A Third Grade Eskimo Play

You might be interested in looking at the program of an Eskimo play which was worked out by the third grade in the Training School, Iowa State Teachers' College in February, 1924.

Scene I

Getting ready to go hunting. In front of the iglu.

Scene II

Hunters return home. In front of the iglu.

Scene III

The feast. In the iglu.

X

LIFE IN POLAR REGIONS

LANDS near the north pole and near the south pole are called polar lands. In some zoo or park you may have made the acquaintance of a bear from one of these regions. Some of the lands near the poles are the homes of both animals and people. But there are other polar lands which are too cold for any people to live in all year around.

POLAR LANDS WHICH ARE THE HOMES OF REINDEER

If the Canadian Government should decide to introduce reindeer into the Coronation Gulf region, from which of the polar lands could it obtain a herd? Reindeer eat the same food that caribou eat and can stand just as much cold. Reindeer live in lands which are about as far from the equator as the home of the Copper Eskimos.

On the globe find the parallel nearest to Coronation Gulf. If you have no globe and have to use the map, the only parallel near there which is marked, is the sixtieth. As you follow along the sixtieth parallel, on which side of it will you look for reindeer lands?

On which continents do you find land as far from the equator as the Copper Eskimo land is? Did you look both north and south of the equator?

The Canadians might buy a herd of reindeer from us. Are you not surprised to find out that we have reindeer in our own country? Where has the United States land cold enough for reindeer? Look at the map of North America. In the north-western part of the continent find Alaska. This belongs to the United States. We bought it many years ago. Is Alaska far enough north for reindeer?

Once Alaska had many caribou. Since white men introduced guns there, wild animals have become scarce. The Eskimos who live in Alaska have had hard work to secure enough food. To help these Eskimos, our government brought in the reindeer.

Where did we buy the reindeer? The Canadian Government might get a herd from the same place.



Courtesy, U. S. Dept. of Agriculture

A herd of Alaskan reindeer, June 27.



Courtesy, U. S. Dept. of Agriculture

A herd of reindeer in Alaska, February 25.

On the map of Asia find a land called Siberia. An American ship sailed along that part of the Siberian coast which is near Alaska and brought back many reindeer.

Reindeer herding has succeeded well in Alaska. The two pictures which men in the service of our government have taken, show some of the fine herds which the Alaskan Eskimos now own.

The Eskimos in Alaska knew nothing about herding reindeer when we brought the first ones to them. Who taught them how to do it? In a country named Lapland there are people who know how to herd reindeer better than any one else in the world. Our government hired some of them to come to Alaska to teach the Eskimos.

The Lapps live a long distance from Alaska. On the continent of Europe is their home country. How far from Alaska is Lapland?

Opposite is a picture of some Lapps in their far-away home. What use do they make of the reindeer when the ground is covered with snow? What do you notice about their clothing that reminds you of the Copper Eskimos?

In the summer the Lapps live in skin tents. They move about with their herds in search of



© Brown Bros.

Some Lapps ready for a trip. Does this look in any way like the winter trip at Coronation Gulf?

pasturage. Do the Copper Eskimos move about in the summer for the same reason?

Compare the Lapland and Alaskan pictures. See how much the Alaskan pastures are like the Lapland plains.

When the Lapp herders left their home and came to the United States, what ocean did they cross? What direction did they sail? They crossed the United States by rail. On the west coast they boarded a vessel sailing for Alaska. In what direction did that ship go? On what ocean did it sail?



© Brown Bros.

A Lapp summer camp. Notice the men holding horns that the reindeer have shed. See the new horns the reindeer are growing. Is their summer anything like ours? Look at the Lapps' clothes before answering this question.

The Alaskan Eskimo learned from their Lapp teachers how to care for reindeers. The herds in Alaska multiplied rapidly. Now a little reindeer meat from Alaska is sold in the United States. Are we more likely to find a reindeer steak in a butcher shop on the east coast of the United States or on the west coast?

AT THE POLES

We have already learned of people living along the northern borders of North America, Europe, and Asia. These people are all hundreds of miles from the north pole. Eskimos who live near the north end of Greenland are the most northerly people in the world. Find how far their settlement, marked Etah on the map, is from the north pole.

The most southerly people in the world are the Indians at the southern tip of South America. Find how far they are from the south pole. Closer to the poles than these two places no people live. Which pole is farther from the homes of men?

When explorers left Etah, Greenland, on their way to the north pole, all the rest of the journey was made through the icy waters of the Arctic Ocean and then over the ice which completely covers the northern part of the ocean.

The explorers traveled north day by day with their dog sleds. Their leader, Admiral Peary, measured the height of the north star. When it was directly overhead he knew that he had reached the north pole. In the ice there he planted the

American flag. He had earned the right to do this for us, because he was the first man to reach the north pole.

Explorers also searched for the south pole. When they had traveled as far as they could in ships, they had to leave them frozen in the Antarctic Ocean. Here is a picture of one explorer's ship



© Brown Bros.

An explorer's ship frozen in the
Antarctic Ocean.

wedged so tightly in the ice that it can go no farther. On board, the men are packing up provisions to be loaded on dog sleds for their trip over the continent of Antarctica.

The men from this ship had a long, hard, dangerous trip, but never succeeded in reaching the south pole. The

first man to reach the south pole, was a Norwegian, Captain Amundsen. All of his countrymen were happy when they learned that the Norwegian flag was unfurled there.



From The Covered Wagon, a Paramount Picture

In prairie schooners like these pioneers came to Iowa.

XI

PIONEER FARMERS ON THE PRAIRIES OF THE UNITED STATES

SOME of the girls and boys who read this book have traveled on a train across Illinois, Iowa, Nebraska, or some other state of the Middle West. Others have driven in an automobile over the highways which cross these level plains. If you have taken such a trip you have seen rich farms, good

homes, large barns, great herds of cattle, many horses, sheep, and hogs.

For almost a hundred years this great central portion of the United States has been called the granary of our country. Here great crops of wheat, oats, and corn are raised. Here are produced the butter, the beef, and the pork which feed many cities. A dozen railways haul its crops to market. Thousands of motor cars and trucks pass over its roads and the streets of its cities.

But this middle western plain was not always built up the way it is to-day. When your great grandfathers and grandmothers were children, people were moving to Illinois, Iowa, Kansas, and Nebraska. They came from the East in covered wagons drawn by horses or oxen. They were pioneers, coming to build homes on the frontier.

When these pioneers came to the Middle West there were no railroads. Most of the way there were no wagon roads. The rivers were not bridged and had to be forded or crossed on a ferry boat.

Mile after mile the pioneers drove over level grassy plains where a few buffalo still grazed. Wandering bands of Indians were yet to be seen.

Let us go back in imagination and join the men

and women who crossed the Mississippi River and moved into that part of the plain called Iowa. If we picture truly how the early farmers of Iowa lived and worked we will know how pioneers in other prairie states founded their homes.

Since the pioneers had no kodaks, we have no pictures of those early days. If we could look into the attics of their grandchildren's homes, we might find many things stored away there which those pioneers used.

EARLY SPRING PLANTING ON THE PRAIRIE

It is early spring in central Iowa. The warm sun has melted the snow from the plowed fields. The ice has gone from the rivers. On cool nights the pools of still water standing in low places freeze over.

Stretching off for miles in all directions lies the unplowed prairie, black from the fires of last fall. The grass has not yet turned green, nor have the flowers begun to come out. Not a tree breaks the view except along a little creek where a few willows grow. In some directions not a single house can be seen, for few people have yet settled in this part

of Iowa. Six miles to the northeast is a little village on the Cedar River, but it is too far away to be seen.

From a log-cabin home come a farmer and his oldest son. To-day they are ready to begin their seeding. The field is all prepared for the planting. Yesterday they made it fine and smooth with a harrow. Last fall the field was plowed so that planting could be done early in the spring. For the farmer knows that the earlier he is able to plant wheat the better his crop. This year the planting is to be done in the last week of March.

It is half past eight before the farmer and his son start to the field this morning. For more than two hours it has been daylight. Work in the field can not begin at this time of year until the morning sun has taken out the frost. For the ground still freezes a little on the chilly March nights.

As the two workers start out from the farmyard the boy drives a yoke of red oxen hitched to a heavy harrow. On the harrow lie several large sacks of seed wheat. An open bag of the same grain is slung about the farmer's neck.

When the field is reached, the boy drops the sacks of grain on the ground and is ready to follow

his father with the harrow. As the farmer walks across the field he dips his hand into the seed pouch and scatters the wheat evenly over the soil. When his bag is empty he goes back to the edge of the field and gets a fresh supply from the big sack of grain.

After the sower comes the boy with his harrow. The harrow is made of heavy oak cross-bars with sharp iron spikes driven through them. As this is dragged over the ground it covers the seed with soil.

Walking beside his slow team the boy guides them straight across with shouts of "Gee!" and "Haw!" The oxen have learned that "Gee" means to turn to the right and "Haw" to the left.

At first the work is pleasant. The rich black soil of the level field makes a soft surface to walk on. Little gophers scamper off on to the prairie as the boy turns his oxen at the end of the field. Birds circle above his head in the clear, blue sky. After the long, cold winter it is a pleasure just to be out in the sunshine.

Soon the steady march back and forth begins to grow tiresome. The boy is glad when his father calls out, "Noon." The lad himself has been looking

at the sun to see what time it is. They have no watch but they can tell it is noon when the sun is half way from east to west in the southern sky. They unhitch the oxen, and go to their cabin home for dinner.

Dinner over and the oxen fed, they return to the field and work steadily all afternoon. When the sun is sinking in the west, both farmer and son are tired and ready to stop. As they go home they hear the soft "boo-hoo-hoo" of the wild prairie chicken, a sure sign of spring. Overhead they see V shaped lines of ducks and geese flying to the north for the summer.

The family is glad to see this field of wheat planted. If the crop is good, they will have enough for themselves and a little to sell. Last year they had to live mainly on cornmeal. Before the winter was over they became tired of corn bread. The nearest place where flour is for sale is seventy miles away. And no way to go to market except with an ox team! Even though there were a store near by, they could not afford to buy much flour for they have no money to spare for things they can do without.

PREPARING FOR THE CROP OF CORN

After the wheat has been planted the farmer's next task is to prepare new land for corn. He has no trees to cut or stumps to pull as had the Pilgrim fathers in New England when they began farming. Yet the Iowa pioneer has work that is almost as hard. The tough heavy prairie sod must be broken with the plow.

In April he starts plowing. Two yoke of oxen



Courtesy, International Harvester Co.

This is the way that many Iowa farmers plow their fields to-day.

are hitched to the heavy plow. The father holds the plow handles while the boy drives the oxen. Keeping the plow in the ground is no easy task. Sometimes the point strikes a granite boulder hidden in the soil and jerks the man nearly off his feet. Sometimes the boy has to sit on the plow beam to hold the plow in the sod.

This hard work goes on all through the month of April. Even then not many acres are turned, for breaking sod is slow work and there are some rainy days when plowing can not be done.

With the month of May warm days arrive and corn planting time is at hand. The oak trees on the banks of the Cedar River are unfolding their new leaves. The farmers say, "When the leaves on the oak tree are as big as a squirrel's ear, it is time to plant your corn." The oak tree is slow in leafing out, and by the time its leaves appear the ground is warm and there is little danger of frost. Corn is easily hurt by frost and not until May is the danger of frost over.

In the pioneer farm home every one works. The mother and the older girl go out to help with the corn planting. The father takes to the field with him an old ax and the boy a heavy iron hoe. With

these they cut holes in the overturned sod. Into each of these holes the women drop three or four kernels of corn. The seed is covered by pressing down the earth with the foot as they step forward to the next hill. Row after row is planted in this way until the field is completed.

On a pioneer farm there is plenty of work for every month of the summer. As soon as the corn planting is done the farmer goes on with the breaking of more new land. He wants to get as much broken as possible before the grass gets high. The summer sun and rain, the frost and snow of winter will rot the grass and roots and make the soil ready for next year's crop.

The farmer and his family have one hundred and sixty acres of land. Only a little bit of it can be plowed at first. By and by every acre will be farmed. They have chosen a good piece of gently rolling land with a deep, rich soil. Only one poorly drained place is to be found on their whole farm. This little marsh or slough (pronounced sloo) is in one corner and can be drained when the farmer has time and money to do it. They hope to pay for their farm in a few years with the grain and stock they will raise. Their land cost them a dollar and a

quarter an acre. They bought it from the government.

SUMMER HERDING

Now that the wheat fields are green and the corn is planted, the cattle must be herded. They can no longer be left to roam where they please. They would be sure to stray into the fields and injure the crops. On the new farms there are no fences, so the cattle have to be watched all day long and driven back if they come near the fields.

This herding falls to the two girls, one twelve years old and the other only eight. The seven cows need not be watched very closely. If the girls stay between them and the fields of corn and wheat that is all they will have to do. The herders do not need to worry for fear the cattle will get into their neighbors' fields, for the nearest neighbor is more than three miles away. Cattle are not likely to wander that far when the grass is good. At this time of year the short, sweet grass covers the ground like a thick mat. The spring rains and the warm sun have brought it on quickly.

In order that the herd may be kept track of more easily a bell is tied around the neck of one

cow. All day long as this cow grazes the little girls hear the tinkle of the bell and know just where their cattle are.

Herding in May and early June is rather pleasant work, even if it is lonesome. The prairie looks like a great green sea, stretching off in all directions. In most places the grass is short, but in the low, damp spots it is more than a foot high. Many different, bright colored flowers are in bloom. Shooting stars, wild roses, tiger lilies, and sweet-williams dot the plain. In places, delicious wild strawberries are to be found.

The older girl carries her knitting or perhaps some sewing with her. In her spare time she will make many pairs of stockings and some aprons before the summer is over.

HOEING THE CORN

After the corn is up, it must be hoed to keep it free from weeds. Most of the hoeing falls to the two older boys. The youngest boy does not help in the fields as he is only six years old. He is the only one of the whole family who does not work steadily all day.



Cultivating corn in an Iowa field, July, 1924.

Endless seem the corn rows, as with their hoes the barefooted youngsters cut out the weeds. Sometimes they stop to snare the little prairie gophers who steal the kernels of seed corn along the edge of the field. Sometimes in the grass at the end of a row they find the nest of a prairie chicken and stop to see if there are any young birds.

By the time the first hoeing is finished, the weeds have had time to get a good start at the other side of the field. So the hoeing begins again. The boys have to keep up this battle with the weeds until the

corn is tall enough to shade the ground. Then weeds do not flourish. The corn is "knee high by the Fourth of July" and the boys are glad to hear the father say, "Now we'll lay the corn by." To the farmer this means to stop cultivating the corn.

MAKING HAY

In early July it is time to cut the prairie grass for hay. The farmer must get a good supply cut and cured before the hot summer sun scorches the grass and burns it brown. Enough must be stored up to feed his cattle and his one horse for the five or six months when they can find no grass on the prairies. Since there are miles of wild grass in every direction it is free to any one who wants it, and the farmer has no difficulty in finding plenty of hay.

Day after day the farmer cuts the grass with a scythe. With wooden rakes the boys gather it into windrows. Almost before it can be raked up, the hot sun has dried it. The long lines of sweet smelling hay are piled in dozens of cocks or rounded heaps. When several acres have been cut the stacking begins. One of the boys drives the ox



Bringing in the hay, July, 1924, very near the place where our pioneer farmer cut prairie grass.

team hitched to a heavy wagon. On the wagon is a large rack upon which the cocks of hay are pitched. When the load is high, it is driven to the center of the hayfield. There the haystack is built, layer on layer. The top is sloped up to a narrow ridge and covered with long grass from a nearby slough.

The workers are perspiring freely. Out in the sun the heat is great. Even on the shady side of the haystack it is about ninety degrees. The noon sun is high in the southern sky. Each day seems hotter than the day before, but the farm work must go on.



July, 1924. The Iowa farmer now
stores his hay in the barn

This first haystack is only a quarter of a mile from the house. As more and more hay is cut the other stacks are built farther away. When the hay is needed for the stock in winter the farmer must drive out and bring in a load. By the middle of July they stop making hay and begin the wheat harvest. Summer is a busy time on a farm. As soon as one piece of work is finished another is begun.

HARVESTING THE WHEAT

The field of wheat is yellow, and heads are drooping. The crop must be cut as quickly as possible. This means long, hard days for every one.

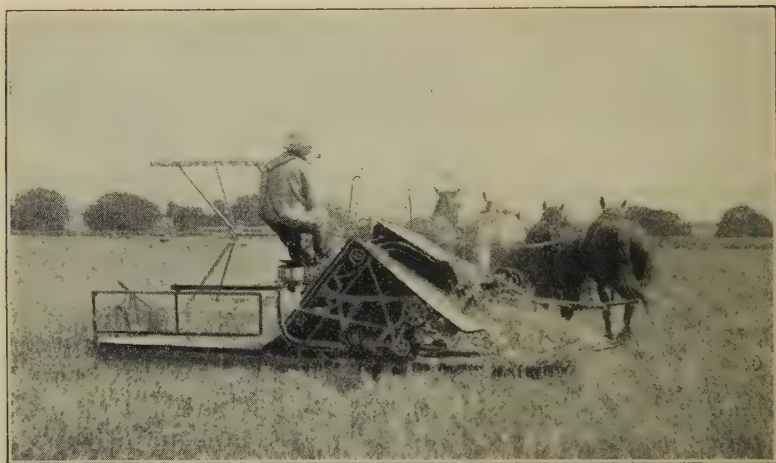
In the morning at a little after four o'clock the men are up, so they may get their chores done before the early breakfast. By five o'clock the sun is peeping above the horizon a little to the north of east. The boy turns the grindstone while the farmer sharpens the blade which is to cut the wheat. As soon as the heavy dew dries up they go out to the field.

With his cradle the farmer cuts the yellow grain. Behind him works the boy gathering the wheat into bundles and tying each with a band of twisted straw. Before noon the father is far ahead of the boy and rows of cut grain lie on the ground to be bound and shocked.



Courtesy, International Harvester Co.

A cradle very like the one which the pioneer farmer used.



July 26, 1924. Binder at work in an Iowa field. This is not such slow work as cutting grain with a cradle.

After half an hour for dinner they are back in the field, and the mother comes out to help. They work till about eight in the evening. It is light enough to work a little longer but there are chores to do. On this first day of the harvest one third of the field has been cut and the bundles set up in shocks. The farmer anxiously studies the sky to see if he may hope for dry weather to finish his cutting.

After the shocked grain has stood for a few weeks it is hauled from the field and stacked. One



This is the way the field looked after the binder had worked half a day.

of the neighbors helps build the wheat stack. There the grain will stand until later in the summer when it will be threshed.

THRESHING THE WHEAT

In late August or September comes a day when the farmer has time to thresh. Near the house is the threshing floor, a piece of hard ground. This is swept clean of all loose dirt. The wagon loads of grain from the stack are brought to the threshing

floor. There the bundles are spread in a circle with their heads toward the center. A yoke of oxen is driven round and round on the grain. Soon the farmer and his son turn over the sheaves. Then the oxen trample them again until all the wheat is separated from the straw. The straw is carried away and stacked for winter use.

Next comes the work of separating the chaff from the grain. Since it is a windy day this can be done at once. The wheat is poured from one measure to another until the light chaff is blown away by the wind.

The rains of April, May, and June, and the hot summer sun have made the rich prairie soil yield a fine crop. The farmer finds that there is more wheat than he expected. Not only has he enough for the winter supply and for next spring's seed, but he will be able to sell some of his crop. Later he will haul this to market.

A TRIP TO THE RIVER

A time comes when the rush of the summer's work is over. On the first of September it is decided that the whole family shall have a holiday.

They plan that they will drive to the Cedar River to gather wild plums. This is a treat that the children were promised some time ago. This morning they are wildly excited. When the chores are done the oxen are hitched to the wagon. The whole family climb in over the high wheels and settle themselves for a long bumpy ride. .

In the clear morning air the ride is beautiful. All along the wagon track the goldenrod and the purple asters are ablaze. Flocks of prairie chickens rise out of the grass as the wagon rumbles by. Bob-whites run across the road and hide in the grass.

Along the high banks of the river grow thick woods. The father points out trees of oak, ash, elm, and black walnut. Over many of these wild grape vines are running. In the open spaces thickets of wild plum are found. These trees are full of the red and yellow fruit.

Quickly the oxen are unhitched and left to graze. All hands go to work to gather the ripe plums. When a prairie family has no fruit of its own, wild plums are a treat. Soon a bushel is picked and then another. The pickers eat nearly as many as they put into the basket. These plums are the only

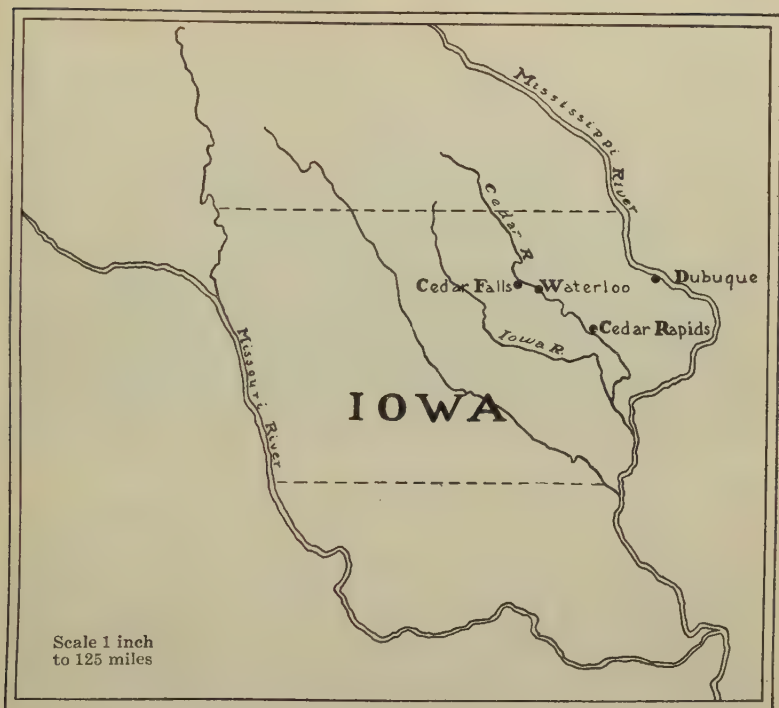
fruit the family have to preserve for the winter except the wild strawberries which they picked in June and July.

No fruit trees or bushes grow wild out on the prairie, except along the streams. The farmer decides that he will return to these woods in the spring and dig up some young plum trees. He will set them out close to the house and in a few years he will have a supply of plums at home.

After the plum picking is finished the family wander through the woods down to the Cedar River. They come to a place where a large spring bubbles out and flows into a creek. Here they eat the lunch which they have brought with them.

While they are eating one of the children notices bees flying about a hole in a dead tree. On the chance that here may be some honey, two of them go to explore. They find that the tree is hollow and that the bees have been storing honey in it. So the father and the boys smoke out the bees and secure several pounds of honey. This they carry home in the pail which held their lunch.

Wild honey which was often found in hollow trees, meant a great deal to the pioneers. Sugar was expensive and they could afford to buy very



The part of the central plains where the Iowa pioneer lived.

little. Honey was much more of a treat to them than it is to boys and girls of to-day. Pioneer children had no jellies and jams and rarely saw candy.

A TRIP TO THE MILL

About the middle of September the farmer finds that he has time to take his wheat to market, and

to have his milling done. The nearest mill is only six miles away in the village of Cedar Falls on the Cedar River. But there he can not sell any wheat. The village is small and nearly every one in it has a farm of his own and raises all the wheat he needs. There is no railroad to carry the wheat from Cedar Falls to a market. In fact in 1850 there is not a railroad in all of Iowa. No steamboat comes to Cedar Falls. Farmers near there must drive seventy miles to the nearest steamboat landing, Cedar Rapids, to sell their wheat.

On the afternoon before the day set for the trip, the oldest boy takes one yoke of oxen and goes over to the nearest neighbor to borrow a wagon. The farmer has two loads of wheat, but only one wagon. After about two hours the boy returns with the borrowed wagon and they begin loading.

Before daylight next morning they set out for Cedar Rapids. Their only guide across the prairie is the faint track made by other wagons. When they come to a stream they find no bridge. Choosing a place where the water is shallow and the bottom hard, they drive across. This they call fording. Fortunately there have been no heavy rains lately, and streams can be forded easily.



This is the way the country looks to-day on the way from Cedar Falls to Cedar Rapids. Where the prairie grass grew are pastures and fields of grain.

When night comes they eat some of the lunch they brought with them. Then, laying their blankets under the wagon, they wrap themselves up and are soon fast asleep. The oxen browse on the prairie grass, but do not wander far away.

On the second morning the farmer and his son see a small herd of buffalo in the distance. As they drive nearer, the animals catch sight of them and go off at a clumsy gallop.

About mid-afternoon of the same day the travelers have an adventure. They come upon a prairie schooner (covered wagon) stuck fast in a slough. The owners have carried out a part of their goods

to make the load lighter. They are now trying to pry the wagon wheels out of the mud. The farmer goes to their rescue. He hitches one of his ox teams in front of the oxen on the wagon and it is quickly pulled to firm ground.

At sunset on the third day Cedar Rapids is reached. At the mill they find other men ahead of them with loads of wheat to be ground. The miller is kind enough to keep his mill running day and night to accommodate the farmers who have come long distances. Even then, he says it will be two days before he can grind their wheat. You may be sure that the boy does not mind this at all. He will have a chance to see the sights of the town.

Early the next morning the farmer and his son go down to the wharf on the Cedar River and find only a big flatboat tied up there. They had hoped to see a steamboat, but they learn that the steamboat could come up as far as Cedar Rapids only in the spring when the water was high. The owner of the flatboat is loading it with wheat and needs a little more to complete his cargo. So he buys all the farmer has to sell. He will take the boatload of wheat to the Mississippi River, where it

will be put on board a steamboat and taken on to a city market.

The farmer receives only six dollars and fifty cents for a wagon load of wheat. After unloading it he and the boy go to the store to buy the supplies they need. They buy a wash tub, salt, a dollar's worth of brown sugar, a package of soda, needles and thread, and some ammunition. These purchases take every cent they had received for their wheat.

Their purchases are packed in the wash tub and it is set in the wagon. A wagon load of wheat going to market, a tubful of supplies going home! And how many days of hard work it had taken to produce that load of wheat!

On the second afternoon the miller begins to grind their other load. His mill stands close to the Cedar River. At this spot there is enough of a fall in the river to allow him to put in a dam. This dam holds back the water and forces it into the mill race and upon the mill wheel. It is this water power that makes the great flat stones turn one on the other. From a hopper the wheat falls between these stones and is crushed into flour.

A part of the grain is kept by the miller to pay

for the grinding. From what remains the farmer has a good many sacks of rather dark colored flour to take home with him. His flour was not like the fine white flour which we buy from the mills of to-day. That old time mill did not have the good machinery which flour mills have now.

A PRAIRIE FIRE

Several weeks after his trip to the mill the farmer is out in the fields busy at his fall plowing. In the middle of the afternoon he suddenly smells burning grass. Looking quickly to the west, the direction from which the strong wind is blowing, he sees a faint smoky haze. His oxen begin snuffing the air. He hears the bellowing of his cattle out on the nearby prairie.

Unhitching hastily, he leaves his plow in the middle of the field and hurries home. He sees the girls running home driving the cattle before them. They know, as well as he, the danger ahead. A prairie fire is coming.

Early in the fall to make safe against prairie fires, he had plowed several furrows around the house and barn to stop the fire. Each of his

haystacks out on the prairie he had safeguarded in the same way. If there were no heavy wind these strips of bare, plowed ground would make everything safe. This afternoon he fears that the wind will drive the fire across them. Fortunately the the field he had just been plowing protects the corn field on its windward side.

By the time the farmer reaches home he can see clouds of smoke rising over the oncoming fire. His wife and children, seeing the fire approaching, have prepared to help him fight it. They have carried buckets of water and old grain sacks out to the furrows around the house.

The furrows alone are too narrow a strip to protect against the great fire. All go to work starting little back fires outside the furrows. When these have burned a few feet they are beaten out with wet sacks. This is hot work. Every one works madly. If the fire reaches them before they have burned off a wide strip, the whole place may go.

On roars the prairie fire. Its great flames leap up in the air. Clouds of smoke hang over it. Soon this drifts to the workers, nearly choking them. Frightened rabbits and a wolf scurry out in front and run past them. The family can feel the hot

breath of the fire as it bears down on them. They can hear it snap and crackle. It sweeps up to the edge of the strip which they burned, flickers a moment—and suddenly dies down. It finds nothing more to feed on. They are safe.

Out to the north and to the south the flames sweep past and leave the little farmyard in the midst of a black waste. One haystack, which has not been well protected, is burning. The other two are safe. Every one is thankful for the escape.

CORN HUSKING

One morning in the first week of October the ground was white with the first hard frost. In a few hours after the sun had risen the pumpkin and squash vines in the corn field were black and wilted. The corn was not hurt at all. It had already stopped growing and the stalks were drying and turning yellow. Corn husking time was at hand.

October mornings were cool and frosty. The sun was creeping a little farther south and each day it was a little later in rising. As it grew colder the frost lingered a little longer each morning. Before daylight the boys were out of bed. Some-



Courtesy, International Harvester Co.

Latest invention for husking corn being introduced into Iowa to-day. The wagon with the throw board is still being used.

times they reached the field before the sun was up. Their hands grew cold and wet from the frost, but before noon the air had warmed up and work was more pleasant.

Up and down the field the farmer moved with the wagon with a high "throw board" on one side. Bang! Bang! went the yellow ears of corn against the board. By noon the wagon was piled high with its golden load. Again in the afternoon a great load was husked and shoveled into the waiting crib.

The corn stalks were higher than a man's head and almost hid the huskers from view. Clouds of blackbirds were roused from their feasting and flew up at the approach of the wagon. All day the calls of the men to the team, the sound of the ears against the board, and the rustle of the dry stalks made the cornfield a noisy place.

When the husking was done, a fine crib of corn showed the results of the summer's work in the cornfields. A year's supply for the family and the stock had been provided.

PREPARING FOR WINTER

The fall season on the farm is a busy time. No sooner has the plowing and the corn husking been finished than the pioneers hurry to prepare for the long cold winter. After the middle of November there will be freezing weather most of the time. The crude log cabin will be none too warm when the wintry blasts from the north sweep across the plains. There is no cellar under the cabin nor is there a foundation. To keep the house as warm as possible they bank it well with straw and dirt. Any cracks which they can find between the logs are stuffed with old rags.

Their fuel supply consists of logs which they hauled from the woods along the river bank last winter. The few logs that are left in their woodpile are cut and split and piled up close to the cabin door. There will be enough wood to last until after Thanksgiving. The farmer hopes there will be plenty to keep the house warm until after the ground is covered with snow. Then he will go to the banks of the Cedar River and cut down trees. These will be hauled home over the snow on a low sled.

Because the family have no cellar they store their winter supply of potatoes, squash, and turnips in a pit near the house. This they cover carefully with straw and dirt.

Load after load of hay is brought in from the stacks out on the prairie. After stacking it in the yard a rail fence is built to keep out the cattle. This stack is to be saved for the stormy days when they can not go out to the prairie to bring in the hay they need for the daily feeding.

AUTUMN HUNTING DAYS

Every few days the boys take the shot gun and spend an hour or two among the corn stalks. Prai-

rie chickens flock into the fields to feed on the kernels that fell during the husking. Sometimes the boys come home with enough birds for two or three meals. Prairie chickens are a great treat, for the pioneer family has but little meat in the fall. The salt pork from the spring slaughtering has all been eaten. The pigs are not large enough to butcher. Besides it is better to wait until cold weather comes so that some of the meat may be frozen. They can then have fresh meat for weeks and weeks. This is a welcome change from the salt pork which is the only meat they have all the spring and summer.

Several times in the late fall the father and the boys shoot ducks and geese as the flocks are flying southward to their wintering places. All through the fall and early winter the boys bring in rabbits which add variety to their scanty fare.

A TRIP TO THE MILL IN CEDAR FALLS

Just before Thanksgiving it is decided to take some corn to the mill to be ground into meal. It is only a day's trip to the mill in Cedar Falls. The whole family will take a holiday. The children



The present dam across the Cedar River at Cedar Falls. Notice the big log brought by the spring floods.

are delighted, as they have not been to town for many months.

A dozen sacks of corn are put into the back of the wagon. The children, bundled up in quilts, sit in the bottom on some straw. It is a very jolting ride over the frozen roads in a wagon which has no springs, but the children do not mind.

On reaching the village the corn is taken over to the mill. This is on the banks of the Cedar River near the falls. A dam has been built at this place as the falls are too low to be used for power. The children peep in the door to see the millstones



The flour mill in Cedar Falls to-day. It stands not far from where the old mill stood.

grinding. These stones were cut from large granite boulders that were found near the mill.

Leaving the corn to be ground, the family walk up the one street of the village. There are no sidewalks. In fact the street is simply a road. Cedar Falls is too new a village to have sidewalks. It has only fourteen houses, a store, a grist mill, and a small saw mill. Trees from the river banks are brought to the mill to be sawed into lumber for new houses.

At Mullarky's store, which has been open only four months, they stop to make some purchases.

The goods in this log cabin store have been brought in wagons from the Mississippi River at Dubuque. This is a haul of a hundred miles. There are few luxuries on the shelves because the pioneers have very little money to spend.

As the family come out of the store they hear a hubbub in the street. A tired man is dismounting from a weary horse just in front of the door. People rush up to greet him. This welcome rider is the mailcarrier who has brought the letters and papers all the way from Dubuque. He hands his mail pouch to the postmaster who takes out the packet of letters for Cedar Falls. While the watchers crowd eagerly about, he sorts it over. A few of the letters he gives to the owners who happen to be near. The remainder of the mail he puts into the crown of his hat. Placing his hat on his head, he goes about his business ready to deliver a letter whenever he meets the owner.

THE GREAT BLIZZARD

On a day in January the worst storm of the winter came. The sky, which had been clear in the morning, turned gray toward noon. Snow began to fall and the wind rose to a gale. Soon

the air was filled with whirling snowflakes. The cold grew greater. Everything was blotted out of sight in the swirling clouds of snow.

By three o'clock in the afternoon the storm had become so severe that the farmer decided to feed his stock for the night, even though it was two hours before the regular feeding time. He knew that by five o'clock he might not be able to reach the sheds. By half past three it was so dark that the mother set a candle in the window to guide her husband back to the house. In such a storm it would be possible to wander round and round until completely lost.

All night the house shook with the fury of the gale. There was not a tree or a fence to break the strength of the wind. Snow drifted in through the cracks about the windows. Up-stairs in the loft that served as a bedroom, a little snow drift formed across the boys' bed. The nailheads in the boards around the door and windows became white with frost.

In the morning the storm was still raging. On one side of the house, snow had drifted half way to the top of the window. It was no use to try to reach the barn. It could not be seen and no one

could find his way in the blinding storm. Looking out of the window, one could not tell the ground from the air.

Though shut in the house the family were not idle. All day the father worked on a new ox yoke which he was cutting out of a block of wood. The mother spun the wool which she had bought from a neighbor who kept sheep. Later she would make the cloth into a suit for the oldest boy. The children

wrote on their slates the lessons which the mother had set the night before.

When the family awoke early on the second morning the wind had gone down and the snow



An old ox yoke used by a pioneer.



A spinning wheel in an attic in Cedar Falls.

had stopped falling. The sky was clear and the stars were shining. Shortly after five o'clock, long before sunrise, the father and boys began shoveling their way out to the shed. The paths they cut through the snowdrifts were deep trenches with walls as high as a man's head. The morning was bitterly cold, at least twenty-five degrees below zero. The boys stopped work and ran back into the house every few minutes to warm their fingers.

Before the men opened the door of the shed the low bellow or moan of the hungry cattle could be heard. On stepping inside the animals were seen, covered with white frost and shivering with cold.

Soon their mangers are heaped full of hay. Later in the day pails of water are carried to the stock. That is a slow and difficult way to water farm animals, but it was impossible to lead them out through the drifts to the well.

AN EXPERIENCE WITH THE INDIANS

In Cedar Falls there still lived when this book was written, one of the first pioneers, Mrs. Chase. She moved into the village in 1847 when she was a girl eight years old. At that time there were

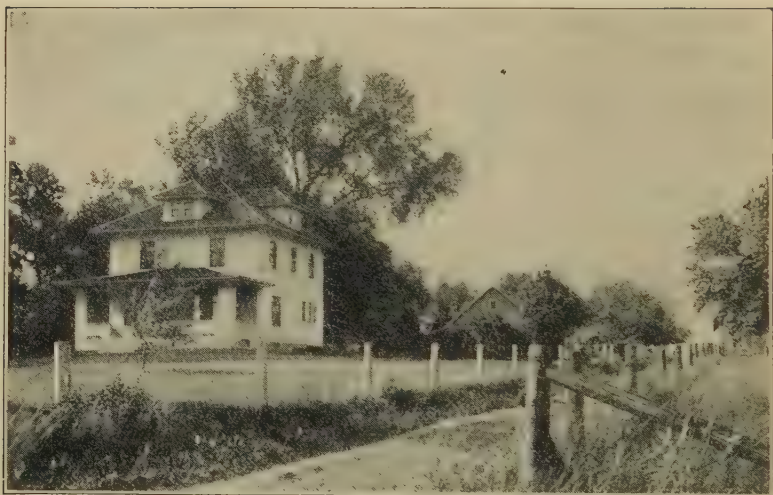
only two or three cabins in Cedar Falls. Of course she had many interesting adventures with Indians who were all around the region in the early days. Here is a story that she told us.

“The last experience that I had with the Indians I shall long remember. The flouring mill, which has lately been burned, was then new. The whole floor was one big room.

“One evening in the early fall as our family sat at supper, in walked two big Indian braves without knocking. They wanted my father to allow them to use the mill for a war dance. Of course he said they could have it. The people in town were all told, so the Indians had a good audience and they went through their long dance to the close.

“Our family had hardly reached home when the same two Indians and their squaws and one little papoose came into the house. They asked to stay all night. My father never turned any one from his door so we locked them in our kitchen. They lay on the bare floor all night.

“In the morning in walked thirty-two other Indian braves for breakfast! It was my work to get breakfast every morning. I had a three-gallon jar of buckwheat batter for cakes with bacon and



A modern farm-house four miles from Cedar Falls, close to the place where our pioneer family lived.

coffee. The men ate first, then the squaws ate, as fast as I could get the cakes ready. They ate everything we had in the house. Then they silently filed out and went away."

LATER DAYS

In 1861 the railroad reached Cedar Falls. The farmers then found a market for their grain without the long haul to Cedar Rapids. Soon they had money to buy farm machinery and to build big barns and good houses.



The barn across the lane.



Farm buildings in Iowa are now protected by groves of trees planted by the farmer.

The people of Iowa are still farmers, as they are in the adjoining states. The deep, rich soil on the gently rolling plains, the long, hot summers, and the abundant rain makes the Middle West one of the richest farming sections in the Union. This region raises more corn than any other part of the United States.

Checks

1. In Iowa the following points are true. But only six of them explain why Iowa is a great corn state. Select those six points.

hot, summer days
long, winter nights
warm, summer nights
many rivers
deep, rich soil
some lakes
level surface
five months free from frost
snow in winter
rains through the summer

2. Fill in the blanks with the names of the proper months.
 - a. In ——— or ——— the Iowa farmer plants wheat.

b. In ——— he harvests wheat. He plants his corn in ——— and husks it in ——— or ———.

3. Which of these things do you expect Iowa children of to-day to be doing in spring, in summer, in fall, in winter?

Playing checkers, baseball, football, marbles, tag, coasting, roller skating, walking on stilts, ice skating, snow balling, picnicking, flying kites, planting gardens, picking apples, shoveling snow.

4. Iowa is in the middle of———.

an ocean

an island

a continent

Iowa is in a———.

plain

mountain valley

forest

prairie

Iowa is the name of a———.

country

continent

state

city

XII

LANDS OF FOUR SEASONS

IN A land of four seasons, like the mid-western plain of the United States, we have certain games and sports for the cold icy winters, others for the cool spring, and still others for the hot summer and the mild autumn.

If you lived on a lowland near the equator, for how many months in the year could you play baseball? In which months could you go swimming? In what months would you play marbles? When would the football season begin? Could you ever go skating? Would you own a sled?

When do Americans play baseball? There is another land of four seasons in which December, January, and February are the months for baseball. Boys there, play spring marbles in October. The football season is March, April, and May. Where is this land of four seasons in which things seem just opposite to ours?

Look on your globe or map for South America. Find a land as far south of the equator as Iowa or Illinois is north. This is Argentina. There you could eat your Christmas dinner out on the lawn, while boys and girls of Iowa and Illinois might be driving through a snowstorm to theirs.

In what month will an Argentine farmer be planting corn? When will he be harvesting wheat? What might the Argentine farmer be doing while the Iowa or the Illinois farmer is shoveling snow? What season is Argentina having on the day you read this? In what season would your birthday be if you lived in Argentina?

Places lying half way between the equator and the north pole have four seasons. Are there any lands of four seasons in Africa? The southern tip of Australia has four seasons but the winters are not so long or so cold as those of Iowa.

If we look north of the equator we shall find many lands of four seasons. On what continents are they? Trace across Europe until you come to southern Russia. This is one of the world's great bread producing regions. The Russian farmer plants his crops about the same time that the Iowa farmer is planting his.

Trace across Asia until you come to North China. There we find more wheat fields. The North Chinese farmer plants his crops about the same time that the Iowa and Russian farmers do.

In all lands of four seasons the farmers must produce food enough in the spring, summer, and autumn to last through the whole year. But the farmer is not the only one who has to look ahead to see that he is prepared for the different seasons. The ice man, the coal man, the builder, and the storekeeper must all be ready for spring, summer, autumn, and winter.



Courtesy, Dollar S. S. Co.

The "President Harrison" starting out from San Francisco.

XIII

ACROSS THE SEAS

A great steamship, the "President Harrison," is tied up at a dock in San Francisco Harbor. On board scores of men are hurrying to and fro. The time is short and there is much to be done, for tomorrow the ship sets out on a long voyage.

Large trucks roll up beside the steamer and their

loads are carried on board by husky stevedores. Stevedores is the name given to freight handlers on the docks. Sack after sack of sugar, barrel after barrel of flour go down into the huge storerooms. Load after load of potatoes, box after box of canned goods follow the same route. All the tea, coffee, and spices which usually are found in your mother's pantry go into the great pantries of the ship. But the ship's supply would fill your mother's cupboards many times over.

Quarters of beef, hundreds of pounds of pork and lamb, scores of dressed chickens and ducks, hundreds of dozens of eggs, tub after tub of butter, crate after crate of fresh fruit and vegetables are carried into the refrigerating rooms. No ice is loaded on board to keep these things cool, for the ship has its own ice plant.

Most of these foods will be eaten before the ship reaches the end of the voyage. This traveling hotel has several hundred people to feed as it steams around the world. One hundred and ten days will have passed before it comes back into the harbor of San Francisco. At each of its twenty-one stops it may take on some provisions, but not so full a supply as it lays in at its home port.

Much fuel is required to drive the ship. So into the fuel tanks are piped thousands of gallons of oil, for the boats of this line are oil burners. Down in the busy engine room the great machinery must be kept whirring day and night to keep the ship moving. Fresh supplies of oil will be taken on several times during the voyage.

Water is the only supply which need not be taken on board at port. Sea water is too salt to drink, but the ship has a plant which can change it into fresh water. Sea water is pumped into the plant and heated. When the water boils, the steam passes into coils where it is cooled back into water in much the same way that steam in your mother's kitchen cools into drops of water on the cool window pane. The salt of the sea water is left behind in the tank as lime is left in a tea-kettle in which very hard water is boiled.

In the hold of the vessel are stowed tons of freight to be carried to distant lands. This is a passenger boat, but it also handles certain kinds of freight. On the table, page 297, you will find a list of things shipped.

The hour for leaving draws near. Passengers hurry on board. They deliver their tickets to the

purser as a passenger on a train gives his ticket to the conductor. Following the bellboys to the cabins, the passengers leave their belongings and go back on deck. Friends are there to see them off. The bell rings and the cry of "All ashore!" sounds out. The visitors hurry back across the gangplank and wave a final farewell from the shore.

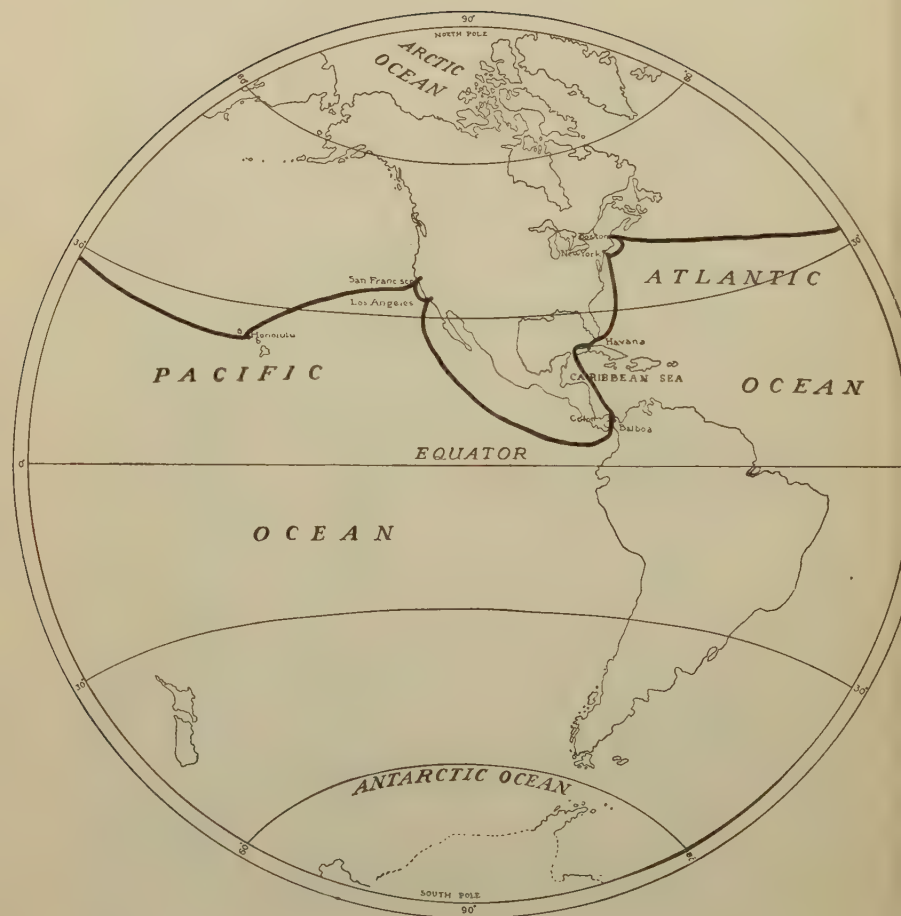
Slowly the ship glides out of the bay and into the Pacific Ocean. Soon the shore line fades behind. On this January day the passengers bid good-bye to America and their trip around the world begins.

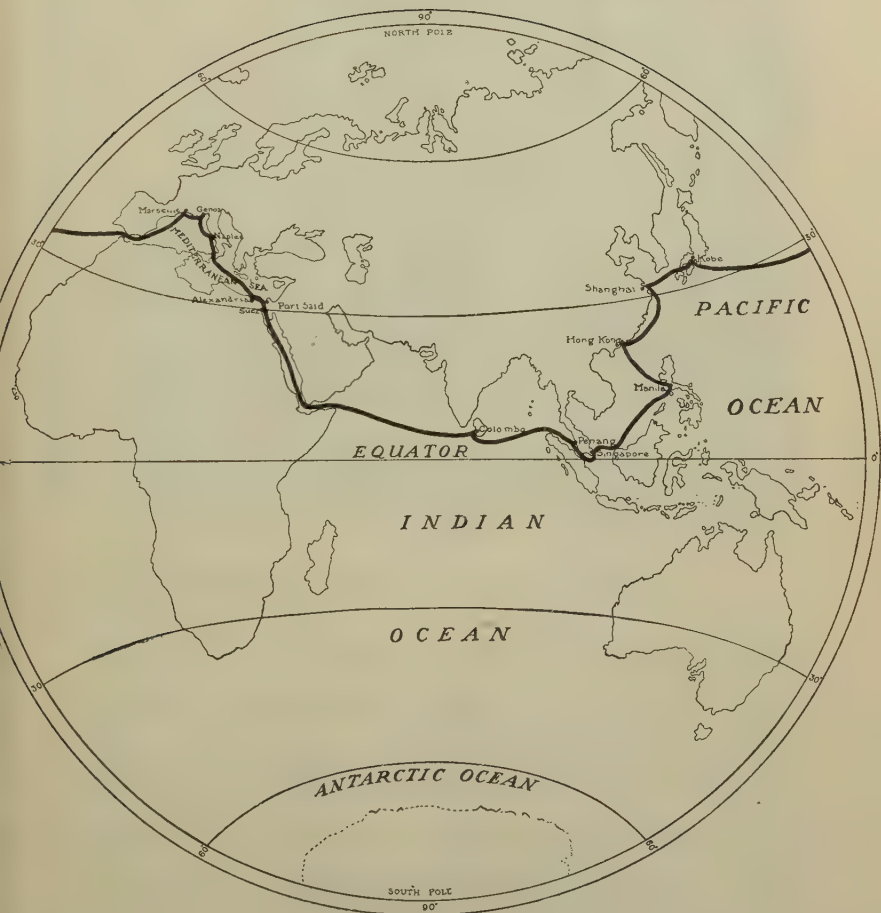
The first day out at sea is cold and raw. Passengers walk the deck with their coats buttoned up to their chins. They know this weather will not last long for the ship will soon reach warmer waters.

On the map, page 292, the route of the "President Harrison" is shown. In what direction does it sail after leaving San Francisco? Each day the noon-day sun is higher in the southern sky. Will the passengers need warmer or lighter clothes as they near Honolulu? Will the captain and the other officers of the ship wear the navy blue woolen uniforms which they wore on leaving San Francisco or will they put on their white duck suits?

This is a copy of the ship's sailing schedule.

PORTS	ARRIVE	SAIL
1. San Francisco, U. S. A.....		Jan. 5
2. Honolulu, Hawaiian Is.....	Jan. 12	Jan. 12
3. Kobe, Japan	Jan. 25	Jan. 26
4. Shanghai, China	Jan. 29	Feb. 1
5. Honkong, China	Feb. 4	Feb. 5
6. Manila, Philippine Is.	Feb. 7	Feb. 8
7. Singapore, Malay	Feb. 13	Feb. 15
8. Penang, Malay	Feb. 17	Feb. 17
9. Colombo, Ceylon	Feb. 21	Feb. 22
10. Suez, Egypt	Mar. 4	Mar. 4
11. Port Said, Egypt	Mar. 4	Mar. 4
12. Alexandria, Egypt	Mar. 5	Mar. 5
13. Naples, Italy	Mar. 9	Mar. 9
14. Genoa, Italy	Mar. 10	Mar. 11
15. Marseilles, France	Mar. 12	Mar. 12
16. Boston, U. S. A.	Mar. 24	Mar. 25
17. New York, U. S. A.	Mar. 27	Apr. 3
18. Havana, Cuba	Apr. 7	Apr. 7
19. Colon, Panama	Apr. 11	Apr. 11
20. Balboa, Panama	Apr. 11	Apr. 11
21. Los Angeles, U. S. A.	Apr. 21	Apr. 22
San Francisco, U. S. A.....	Apr. 24	







Courtesy, Dollar S. S. Co.

On deck "S. S. President Harrison." Do you think the ship is nearer to the equator or to the pole?

The distance from San Francisco to Honolulu is about two thousand one hundred miles. How far does the ship travel in one day?

Day after day passes pleasantly. There are many interesting things to fill the time,—walks on deck, talks with fellow passengers, games both indoors and out-of-doors, concerts by the ship's orchestra, entertainments by radio. The meals in the beautiful dining-room, are as fine as those served in good hotels. Bouillon is served on deck every morning at ten o'clock, and tea at four in the afternoon.



Courtesy, Dollar S. S. Co.

Eating dinner on board the "President Harrison."

The passing of another ship is a great event, because for days at a time there is nothing to see but sky and water. When a shoreline appears in view the passengers are thrilled.

On what part of the journey round the world is the "President Harrison" longest out of sight of land? At what place is it nearest the equator? Name seven seas the "President Harrison" crosses. Name the continents it visits.

There are two places where canals have been dug in order to save a long sail around a continent. One of these canals is between Colon and Balboa. It is called the Panama Canal and it belongs to the United States. The canal connects the Pacific Ocean with what sea? What two continents does it separate? The narrow neck of land through which it was dug is called an isthmus. Because this isthmus was narrow, man was able to dig a canal through it. This was such an enormous piece of work that it cost millions of dollars and took about ten years to complete it.

The other canal lies between Suez and Port Said (Sa-eed). It is called the Suez Canal and it belongs to the British. It saves a trip around the continent of Africa.

As the "President Harrison" on its voyage around the world calls at the various ports shown in the table opposite, it unloads some of its cargo and picks up new cargo. Here are some of the things it unloads and loads. See if you can trace the route taken by some of the things you use have taken.

AT THE PORT OF	SHIP UNLOADS	SHIP LOADS
1. San Francisco	Tobacco, dates Panama hats	Flour
2. Honolulu	Flour, clothes Watches, hats	Pineapples
3. Kobe	Flour Movie films	Silk, dishes Parasols
4. Shanghai	Flour, cloth	Licorice Silk
5. Hongkong	Flour	Tea, ginger
6. Manila	Bolos, Canvas shoes	Coconut oil
7. Singapore	Cloth	Rubber, bamboo Nutmegs
8. Penang		Pepper
9. Colombo	Cloth	Tea
10. Alexandria	Spices	Cotton, dates
11. Naples	Tea	Olive oil
12. Genoa	Cotton	Macaroni
13. Marseilles	Silk Coconut oil	Perfume Ribbon
14. Boston	Olive oil Macaroni Tea	Shoes
15. New York	Perfume, spices Rubber, parasols	Clothes, bolos Machetes
16. Havana	Machetes	Tobacco
17. Colon		Panama hats
18. Los Angeles	Parasols	Movie films

INDEX AND HELPS IN PRONOUNCING
NEW WORDS

INDEX AND HELP IN PRONOUNCING NEW WORDS

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